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BANCROFT TRAINING SCHOOL

FOR

MENTALLY SUBNORMAL CHILDREN

HADDONFIELD, N. J.

MANUAL
OF THE
COURSE OF STUDY

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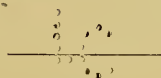
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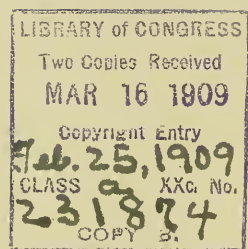
ARRANGED BY
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INTRODUCTION.

The following course of study is planned to meet the needs of the pupils of the BANCROFT TRAINING SCHOOL. It aims to present the studies which normal children are taught in such form that they may be grasped and understood by subnormal children.

The commonly accepted methods of instruction used in our schools and kindergartens are inadequate in accomplishing this end. New methods of instruction must be found and modifications of old methods devised, if appreciable results are to be obtained. The character of these additions and modifications depends entirely upon individual peculiarities. Each subnormal child presents a distinct and separate problem, and his needs, limitations and abilities must be considered quite apart from those of his classmates.

It is impossible to describe all the methods and modifications which may be required in training subnormal children. A statement of general principles may be made, however, leaving the question of individual application and adaptation to the ingenuity of the teacher.

It may be well to state briefly the point of view which the teacher should assume regarding her work. This should, first of all, be *affirmative*. The teacher should feel confident that her pupils can do what she requires of them. She should *expect it* of them. Subnormal children are peculiarly sensitive to the mental attitudes of those about

them, and a feeling of doubt or a sense of failure on the part of the teacher, even though unexpected, will make itself felt in the work.

It is a commonly accepted theory that mental processes are functions of brain-tissue, just as muscular contractions are functions of muscular tissue. If the brain-tissue is lacking or imperfect, the mental process will be non-existent or rudimentary, just as in the absence of muscle-fibres there would be no motor action. If this were true there would be very little use in attempting to train subnormal children. Many of them would have to be regarded as beings without minds, as mere active physiological mechanisms. But this viewpoint is productive of no results. The teacher who hopes to accomplish something tangible in her work, must view her pupils in a very different light. She must regard them as *children whose bodies are defective, but whose possibilities of mind are normal*. In other words, she must regard them as possessing an *ego* or *personality* within the physical body, and her aim must be to *draw that personality out*.

This can be done only through the physical body. It may thus perhaps be said that there is after all no real difference between the two points of view. But this is erroneous. There is an essential difference, a difference of intention and aim, of attitude toward the children and of incentive regarding their education. It is just this difference which brings success instead of failure. Whether or not the question be true in itself, it *works well*, it accomplishes *results*; and this fact is sufficient to recommend its acceptance.

Much of the early training of subnormal children is what may be termed pre-kindergarten training. In other words, they must be taught, sometimes by laborious methods, what normal children learn readily in the first two or three years of life.

The elementary mental processes of perception, attention and association may be so rudimentary as to be practically useless. These must be trained. It may be necessary to find means to arouse even consciousness itself. The simple act of grasping an object, or of picking it up and putting it down may be a well-nigh impossible task. In developing these fundamental functions, methods and apparatus, which are not found in any ordinary school, are necessary; and infinite patience and perseverance are required. It may take a year to teach a child to place one block upon another; five years may be required to elicit the first intelligent spoken word. Such results may appear very discouraging, but if the work is continued long enough, the final accomplishment will more than repay the long hours of toil.

The need of individual training is of paramount importance. Many children, especially the younger ones, will require the entire attention of the teacher, and must be regarded as special pupils who are to be taught by themselves. Under no circumstances should the classes be large. In the early grades from two to five children are all that can be successfully handled; in the advanced classes from five to ten pupils may be grouped together. In elementary work one or more assistants should be present if there are more than two children in the class.

There are two important problems to be kept in mind in the training. The first is to improve the defective physical body so that the mind may be reached and may respond; the second is to educate the mind itself through the body.

The physical training comprises the development of function and structure by exercise, and the correction of functional and structural defects. One of the most important phases of this part of the work is the training of the special senses. Much time and care should be devoted to visual, auditory and other sensory exercises. Muscular coördination is also important. In most subnormal children this function is very imperfect, and special training is necessary. The ordinary occupations used in developing coördination are rarely satisfactory. This is particularly true regarding hand-work, the mat-weaving, card-sewing, etc., of the kindergarten being quite inadequate. It is to be noted that whatever material or objects these children are given to handle or work with should be large, much larger than ordinary kindergarten material.

The mental training should be primarily objective. This is of course a pedagogic rule which applies to all education, but its enforcement here is particularly necessary. Constant appeal must be made to the senses. Attention and interest are hard to arouse, imitation is imperfect, memory is inactive, and fatigue is readily induced. For this reason the lesson-periods should be short and their sequence planned to give as much variety to the work possible.

Esthetic training is usually thought to be a waste of time, but this is by no means the case. An appreciation of beauty and harmony in form, color and arrangement may be

developed in subnormal children as well as in normal ones. Results are best accomplished in this kind of training by keeping the children constantly in a beautiful and harmonious environment. They should be *immersed* in it. When this is done the effect will in time be noticeable even though the child is unaware of it.

PHYSICAL CULTURE.

This work is concerned chiefly with the development of the voluntary muscular system and its nervous control, and with the improvement of nutrition. There are two subdivisions of the work:

I. *Active Gymnastics* (in which are included dancing and some forms of play), and II. *Medical Gymnastics* (embracing passive movements, massage, vibration and electrical treatment).

In active gymnastics attention must be paid to individual needs. These are very varied, and all the members of a class will rarely be able to go through the exercises together. It must be remembered that subnormal children are easily fatigued, and are very sensitive to cold and to draughts. They are apt to show more strength than endurance, and must be treated accordingly. Nearly all of them, especially the younger ones, are deficient in kinesthetic sense. This is often due merely to the fact that this sense has remained unused and thus undeveloped. On this account the children will rarely be able to imitate the instructor's movements without help. An assistant should therefore be employed to put every child through the movements of each

exercise, the instructor meanwhile performing the same movements so that the child may see them. It will be necessary to take hold of the hands and feet of the pupil and move them, perhaps very many times, before the impulse to make the same movements voluntarily will be called forth.

The second subdivision aims to correct the special defects of the individual pupil. The work is to be done entirely according to the physician's prescription, and is therefore omitted here.

KINDERGARTEN.

This class needs particular individual attention. All are of low endurance. No. 2 and No. 3 are spasm children, and must be watched accordingly. (See list for key to these numbers). No. 3 is hemiplegic, and requires special attention to the left side. No. 1 is of very lax fibre, with a tendency to spinal curvature. Her gait and posture need special attention, particularly with reference to the action of hip and ankle joints. No. 4 is vigorous, but her attention is very diffuse. She does not imitate readily, and needs special control to keep her at work.

The following exercises may be used: walking, marching, running, jumping. The steps, ladder, rings and stalls are to be employed. The walking beam and walking board may be used with care.

Coördinative gymnastic work should be given in the form of free exercises. These should be done in imitation of the instructor, an assistant controlling the pupil. The instructor will select the exercises according to the needs and capabilities of the child.

Rhythmic coördinative work should include the march, side-step and gallop. The following simple square dance should be taught, four attendants making up the set. The music of the *Lancers* is to be used:

Figure I. Salute partners.
Leads forward and back.
Sides forward and back.
All hands gallop.

Figure II. Salute partners.
Leads forward to opposite station.
Sides forward to opposite station.
All hands gallop.

PRIMARY II.

This class requires individual instruction. No. 3 and No. 2 are spasm children. No. 3 needs training in prompt response to command. No. 2's eyesight is defective. He tends to overexcitement with jerky, incoördinate movements, and should be given exercises in slow, easy, rhythmic movement. No. 1 has a habit spasm (head-knocking), which must be carefully controlled. She should have particular attention paid to the arms, shoulders and neck.

The work of the kindergarten is to be repeated by this class. Greater thoroughness should be required. In teaching the square dance particular attention should be given to ease, accuracy and grace in position, motion and rhythm. The work may be improved by the use of four 8-foot ropes weighted at each end. These ropes are to be placed upon

the floor in the form of a square. They should never be omitted in teaching the square dance. The couples should stand outside the square, and step over the ropes in advancing to the center.

The following exercise in rhythmic coördination should be introduced in this class:

Wreath Dance. The materials necessary for this exercise are the four ropes mentioned above, and several semi-circular hoops measuring about two feet from tip to tip. One hoop should be provided for each pupil. They should be trimmed with flowers or some other simple decorative material.

Figure I. The pupils stand in a row at intervals of three feet, facing the teacher. The wreath is held in both hands, the hoop arching above the head. One rope is placed behind the line, a second in front of it. The interval should be 18 inches. Standing at place the children are taught to lower and raise the hoop in a forward direction at the command: "Down! Up!" This should be done by each child until it is readily accomplished. The class should then lower and raise the hoops in unison. Music may be introduced to aid this part of the work.

Figure II. A third rope is placed parallel to the second and eighteen inches in front of it. At command the pupil steps forward into the space thus made and comes to position. The wreath is then lowered and raised twice at command. The child then steps backward to place. Each pupil is to repeat this alone. The class should then repeat it in unison.

Figure III. This figure is similar to the second except

that a fourth rope is added and the pupil takes *two* steps forward to position.

The wreath dance should never be performed without the ropes, and the later figures should not be taught until the class is thoroughly familiar with the earlier ones.

PRIMARY I.

In point of endurance the class ranks as follows: No. 4; No. 3; No. 2; No. 1. No. 1 has a heart lesion, and cannot stand sudden or prolonged strain. He should always be carried upstairs. No. 2's circulatory system is unstable; he is subject to nervous irritability, due partly to defective eyesight, and at times he has attacks of petit mal.

The kindergarten work is to be repeated by this class. The two-step may be added, and the wreath dance learned. In the latter the wreaths should be dipped first to one side, then the other, in addition to the forward dip. The dance should end with a march.

INTERMEDIATE II.

Endurance in this class is as follows: No. 4; No. 5; No. 2; No. 3; No. 1. No. 1 has a heart lesion and an irregular pulse. She is nervous and at times irritable. She should be kept active without fatigue, her work being very light. She should not be kept at work longer than ten minutes. Walking should be limited to 200 yards. She should never be allowed to walk upstairs or do any climbing; nor should she be subjected to any sudden strain. No. 2 should be spared heavy work. Attention should be paid to her gait and posture.

The earlier work is to be reviewed. Work with the quarter-circle may be added (except No. 1), and the boys may have exercises on the overhead ladder. Dumb-bell and wand exercises may be introduced. Rope skipping may also be taught to all but No. 1. The exercise should be very brief, however, being limited to one or two minutes. The class should learn the square dance, but the wreath dance may be omitted. An additional brief fancy dance may be arranged by the teacher, using the two-step for a basis. The waltz-step may also be taught. The children should be drilled in changing step when the time of the music changes. The march, gallop, two-step and waltz may be used in this exercise. The aim should be to have the change of step made promptly and without confusion. If necessary specific music may be used for each step, but if possible the class should be taught to recognize the change in *time* rather than in *tune*. Battledore and shuttle-cock and grace-hoop may be introduced as part of the gymnastic work.

INTERMEDIATE I.

Several pupils in this class are delicate. Endurance is low in No. 1, No. 4 and No. 3. No. 1 should have special individual work only. This may consist of walking, marching, and elementary coördinative exercises. No. 4 should be given light work only, paying special attention to posture, and to hands, arms and shoulders.

No. 3 and No. 5 need particular training in gait and posture. No. 5 should have special exercises on the quarter-circle, with attention to the dorsal and cervical spine. No. 2 has defective vision, which interferes to some extent with

his work. He should be given everything he can do, however, and special training should be added in distant vision. For this purpose a handkerchief may be placed on the floor at one end of the gymnasium, No. 2 being required to run as quickly as possible from the other end of the gymnasium to the handkerchief and return with it. The exercise may be varied, using a potato in a spoon or on a fork, etc. No. 6, No. 5, No. 7, and as far as possible No. 3 and No. 2, are to be given the regular work. This should consist in a review of the earlier work. The quarter-circle may be used, but with care. Neck-stretching may be given, and additional floor-work introduced. The wreath-dance is to be omitted. The square dance should be learned, a third figure being added as follows:

Figure III. Salute partners.

Leads forward and back.

Sides forward and back.

Leads, ladies to center and salute.

Sides, ladies to center and salute.

Grand chain.

The grand chain should be repeated until the class is perfectly familiar with it. When it has been well learned, it may be used as a basis for a May-pole dance to be taught out-of-doors in the spring. Special steps are to be taught this class in preparation for the May entertainment.

ADVANCED.*

Endurance in this class is moderate. No. 1 is hemiplegic and must be spared heavy or prolonged work. Her left

* *Note.* Special Class A will take the same work as Advanced.

side requires special attention, care being taken not to over-tax the arm and shoulder muscles. Motion in this arm is limited. No. 2 is a laparotomy case. She should avoid lifting weights, raising her weight upon the rings, and all overhead work that requires prolonged raising of the arms above the head. No. 11 has weak ankles. She should be watched carefully in running, jumping and other exercises involving the muscles of the calf. The remainder of the class may do all regular work.

All the earlier exercises are to be reviewed. Additions may be made to the floor and apparatus work at the discretion of the teacher. Two new dance-steps may be taught, introducing combinations with those previously learned. Attention is to be paid particularly to poise, grace and perfection of rhythm.

SENSE TRAINING.

Subnormal children almost always have some sensory defect, and the development of the senses should therefore be made a fundamental part of the training. The senses are trained to some extent continuously during waking hours, and especially during the hours of school work. But it is necessary to add to this special exercises which shall aim to develop the various sensory mechanisms. The aim should be development of the actual physical structures, the nerve-endings and fibers, and the brain-centers and areas, rather than of the memory and association of sensory impressions. It is to be noted that this development may

be accomplished even though the child is not clearly conscious of the sensory impression. Every ray of light or color that strikes the retina, every wave of sound that falls upon the tympanum, *exercises it*, although the pupil may not know or recognize the impression. The effect is like that of the aimless and unconscious movements of an infant, which result in development of the muscular system. Pure physical exercise is therefore the primary aim. The mind is of course trained at the same time, attention and memory being required to measure the results obtained.

In the earlier exercises of this work it is necessary to use purely mechanical devices, which are as far as possible lacking in associative factors.

I. VISUAL TRAINING.

KINDERGARTEN.

The first exercise to be taken up is in the perception of form. To this may be added perception of color. The apparatus needed is as follows: a piece of black felt two feet square; a black cloth, paper box, or other convenient cover; and three objects, namely, a shining white sphere, a red cube, and a green cylinder. These objects should be large (sphere three inches in diameter; cube three inches square; cylinder three by five inches).

The colors black, white, red and green should be standard colors. They are employed for the following reason: according to a widely accepted theory of color-vision (Hering's) there are in the retina three substances which

perceive color. The first perceives white and black, the second, red and green, and the third yellow and blue. Intermediate colors are perceived by two or more of these substances. The perception of color by these substances is accompanied by a chemical change. In each case one color disintegrates the substance, the other rebuilds it. Thus white breaks down the first substance and black rebuilds it, red breaks down the second substance, and yellow the third. The colors mentioned are therefore used as much as possible in their physiological pairs, thus obtaining the greatest amount of exercise of the retina. Shining white is used first because it contains the widest range of rate-variation in the vibrations of the light waves, and because it affects structures in the retina different from those affected by red, green, etc.

The work is begun by placing the sphere, covered by the cloth, in the center of the square of black felt. The cover is then removed and the pupil required to look fixedly at the sphere for not less than ten seconds. The cover is then replaced. It is sometimes difficult to fix the pupil's attention upon the object. To aid in this a small electric flash-light may be used, flashing it upon the polished surface of the sphere, or a small gong or electric bell may be concealed under the black felt, and made to ring by a button controlled by the teacher. Attention should never be fixed by *moving* the object. This should invariably remain stationary. After the object has been re-covered the teacher should ask: "What did you see?" To which the child replies: "I saw a sphere." The answer should always be a complete sentence. "A sphere," or the simple word "sphere" or "ball"

should never be permitted. It will probably be necessary to teach the pupil the word *sphere*. If the child cannot speak, an attempt may be made to learn whether the sphere has been recognized by having him select a sphere from among several objects grouped nearby.

This exercise must be continued until the pupil is thoroughly familiar with it.

The color of the object may then be introduced. The teacher should ask: "What did you see?" "I saw a sphere." "What color was the sphere?" "The sphere was white." Later the pupil may say: "I saw a white sphere." The color of the background should also be noted. The child may say: "I saw a white sphere on a black cloth (or table)."

The red cube may then be taken up, and later the cylinder. When the objects taken singly are all readily recognized by the pupil, two may be taken together. For this purpose the cube and the cylinder should be used first. The pupil should say: "I saw a red cube and a green cylinder." Finally all three objects may be utilized.

PRIMARY II.

The work of the kindergarten is to be reviewed. Two objects may be added, namely, a blue pyramid with a square base (3 by 3 by 5 inches), and a yellow cone (3 by 5 inches).

When all five objects are readily recognized, both separately and together, a new concept may be introduced, *i. e.*, the concept of size. For this exercise objects similar to the ones in use, but of smaller size are to be provided. The child may say: "I saw a large red cube and a small green

cylinder," thus bringing out the difference between *large* and *small*.

In this class a beginning may be made in correlating the forms learned with common objects. Thus the sphere may be correlated with an apple, or an orange, the cube and pyramid together with a house, the cylinder and cone together with a tower, etc.

PRIMARY I.

The earlier work is to be reviewed. The comparative of the adjectives *large* and *small* should be taught here. The difference between *large*, *larger*, and *small*, *smaller*, may be brought out, using suitable objects. The concept of spatial relation should then be introduced. The static phase of this concept, or that which refers to location, is the only one which should be taught to this class. The exercise should be in general terms. Thus the teacher may say: "What do you see here?" the child replying "I see a white sphere there." The concepts *here*, *there*, *near*, *far* should be brought out.

INTERMEDIATE II.

Review. The class should be drilled in speed and accuracy in recognizing and naming the objects shown. The time in seconds required for a child to name an object or group of objects should be noted, and the training directed toward shortening this period.

The three degrees of comparison of size should be taught: *large*, *larger*, *largest*; *small*, *smaller*, *smallest*. The models and also common objects may be used for this.

The concept of location may be amplified by introducing relative location or *position*. The child may say: "I see a white sphere behind a red cube," etc. The meaning of the following should be taught: *above, below, before, behind, upon, beneath, within, top, bottom, front, back, side*.

This class should be given exercises in selective color-vision. For this purpose colored papers may be utilized. Only those colors should be used, however, that have been previously employed in the visual exercises. Drill is to be given in matching and naming a color selected by the teacher and in selecting from several colors one named by the teacher.

A beginning may be made in the study of variations of color. The first point to be considered is difference in *tint*. The teacher should demonstrate that a mixture of red and white will produce pink, and that the tint depends upon the proportion of the two colors. The other standard colors may be similarly treated. Water-colors should be employed for this exercise. (See Painting in Manual Work.)

INTERMEDIATE I.

Review all previous work. Further training in speed and accuracy should be given by the following exercises: a number of geometric forms are to be placed under cover upon the square of black felt. Not less than ten objects should be used. They are then to be uncovered for a few seconds, then re-covered, and each pupil required to name as many of the objects as possible, the teacher keeping a careful written record of the results. It may be necessary at first to use a long exposure, perhaps

ten seconds, but the training should be carried on until a single second's exposure is sufficient.

A similar exercise may be performed, using the following common objects: ball, teaspoon, vase, saucer, button-hook, small doll, brush, cup, flower, pencil. The list may be varied by the teacher.

Another similar exercise may be introduced, the pupils naming colors instead of objects.

Training in *sequence* should then be commenced. The pupil should be taught to remember a series of sense perceptions in the order in which they are received. Sequence relating to form is first to be taken up. Five geometric objects are used in the following order from left to right: cube; pyramid; cylinder; cone; sphere. This order is selected because the forms thus blend naturally into each other. The pupil should first be drilled in exploiting these objects from a given point of orientation (the left-hand end of the series should be first selected). The order may then be changed, and the exposure of the objects to the pupil's vision limited, beginning with five seconds. After an exposure of this length the objects are to be covered, and the child required to name them in order in the direction of exploitation. The time of exposure is then to be shortened until very accurate and rapid results are gained. The point of orientation may then be changed and the exercises repeated. (See Memory-training.)

In color-vision *shade* should be taken up. The mixture of red and other standard colors with black should be studied. The various *shades* thus produced may be illustrated with water-colors. (See Painting.)

ADVANCED.

A thorough review of the work of the previous classes should constitute the greater part of the work of this class. Seven new geometric forms may be introduced as follows: the hexahedron or square prism (dimensions $3 \times 3 \times 5$ inches; the right-angled triangular prism (sides adjacent to the right angle 3×5 inches); the equilateral triangular prism (3×5 inches); the ovoid (long diameter 3 inches); the ellipsoid (long diameter 3 inches); the hemisphere (diameter 3 inches); the circular plinth (diameter 3 inches, height 1 inch). These objects should all be white. They may be used singly and in small groups until their names and forms are familiar to the class. They may then be used in the visual speed exercises.

The exercises in sequence of form may be varied by sending the pupil from the room for a moment after permitting him to observe a given series of objects. During his absence the order of the objects is altered, and he is required on his return to tell what change has been made.

Sequence of color may be commenced by exercises with the standard spectrum colors in their order: red, orange, yellow, green, blue, violet, using slips of colored paper (1×2 inches). The order may be changed and the pupil required to point out the alteration and tell what the proper order should be.

II. AUDITORY TRAINING.

KINDERGARTEN.

The training should begin with exercises in the differentiation of *quality* of tone. The child should be taught

to tell one kind of sound from another. First of all he should learn how to make different sounds. A bell, a whistle and a small policeman's rattle are to be used for this. After he is familiar with the sounds of the instruments (and if possible the names), and can produce them without help, he should be taught to repeat the sounds after the teacher. The teacher should make a sound with one of the instruments so that, although the sound may be readily heard by the pupil, the instrument used cannot be seen. The pupil should then have the three instruments placed before him and should be required to select the one used and repeat the sound made by the teacher. Great care must be taken to give the child no hint by a motion of the body, hands or eyes, or in any other way, as to which instrument was used. He must be required to make the selection entirely by auditory sense, recognizing the quality of the sound, and associating it with the proper instrument.

PRIMARY II.

The early work is to be reviewed and two new sounds added, namely, the triangle and the drum. The training may be further developed by requiring the pupil to repeat two, and finally three sounds, in the order in which they were produced by the teacher, without being permitted to see the source of the sounds which the teacher made.

PRIMARY I.

Review. The class should be made perfectly familiar with the names of the instruments used, and should be required to name them from their sounds alone, the instru-

ments themselves being concealed. The sounds of animals should also be taught. The following familiar animals are to be used first: horse, cow, dog, rooster.

At this point the recognition of *intensity* may be introduced. The instruments used in the previous work may be employed, and the pupil required to say: "I hear the horn. It makes a *loud* sound." "I hear the horn. It makes a *soft* sound." Care should be taken that the loud and soft sounds are produced by the same instrument. To prevent confusion in the pupil's mind, it is necessary in this elementary work to have only one factor varied at a time. In other words, when the intensity changes, the quality should remain the same.

(*Note.* The class may take short trips from time to time to nearby farms [Bell's, Gill's] and to the Zoological Gardens in order to become acquainted with the sounds of common animals.)

INTERMEDIATE II.

Review. The recognition of *pitch* is to be taught in this class. The difference between *high* and *low* pitch should be taught, the tubeophone or piano being used in addition to the other instruments. Thus the child may say: "That sound of the piano is high." "That sound of the piano is low." Care should be taken that the high and low notes are made on the same instrument, *i. e.*, the quality and intensity should remain unchanged, while the pitch varies.

At this point sufficient auditory development will have been obtained to warrant the introduction of more complex exercises. The combined variations of quality, intensity and

pitch found in music may be utilized. A graphophone should be used, the following instruments being introduced: piano, violin, cornet. The human voice (soprano) may also be used. In addition the class should be made familiar with three classical pieces, so that they may recognize them just as they would recognize famous paintings.

INTERMEDIATE I.

Review. A wider scope may be given to the recognition of differences in quality, intensity, and pitch. The difference between *shrill* and *deep* may be pointed out.

A simple explanation may be given of the way in which the production of a tone in a bell differs from that of a stringed instrument.

The graphophone exercises are to be amplified by the addition of the following: brass band, stringed orchestra, high soprano voice, deep bass voice.

ADVANCED.

Review. Training in the localization of sound should be introduced here. In order to obtain good results an instrument that makes a quick sharp click should be used (an elevator-starter's "clapper" is suitable). The pupil is to be blindfolded and required to tell the direction from which the sound comes, his head remaining stationary. A single click only should be used in each attempt, the sound being produced about three feet from the pupil's ear, first on one side, then the other, then above, behind and before. Care must be taken to give the pupil no hint of the direction of the sound by footsteps, the rustling of clothing, etc. To

prevent confusion by reflection of sound the child should be seated in the center of the room. The results of the training are to be kept by the teacher in a carefully written record.

In the graphophone training, the class may review the earlier work and add five new classical pieces.

III. OLFACTORY AND GUSTATORY TRAINING.

KINDERGARTEN.

In this class the exercises in taste and smell should be elementary. It is to be remembered that, with the exception of four stimuli, all gustatory sensations are a combination of taste with smell. These four pure *gustatory* sensations may be taught as follows: bitter (dilute tincture of *nux vomica*); sweet (cane sugar syrup); sour (dilute citric acid); salt (strong solution of common salt). These substances are to be applied to the tongue with a small pledget of cotton on a probe or toothpick. The pupil should be blindfolded, or the bottle concealed so that recognition of the substance shall depend wholly upon taste. If the pupil is blindfolded care should be taken that this is complete, and that it is comfortable to the child. An uncomfortable or unaccustomed bandage over the eyes may so distract the attention as to make the sensory training fail. An excellent plan is to use a pair of automobile goggles in which the glass has been painted white. The mouth should be washed out with water after each test, as the child will otherwise get a mixed sensation that will be confusing. This

training is to be repeated, even if the child is unable to name the substance used, because it gives exercise to the nerve-endings and sensory pathways, if it does nothing more.

Smell may be exercised by the following stimuli: dilute ammonia, camphor, oil of cloves, oil of peppermint. These substances are selected, not because they are familiar, but because they are vigorous stimuli and serve to awaken the olfactory sense into activity.

PRIMARY II.

Review. The following complex *gustatory* stimuli may be added: coffee, black pepper. The following additional *olfactory* stimuli are to be used: oil of wintergreen, kerosene.

PRIMARY I.

Review. The following *gustatory* exercises are to be added: chocolate, mint, grape-juice. Add the following *olfactory* stimuli: oil of cinnamon, wood alcohol, licorice.

INTERMEDIATE II.

Review. Add the following: *Gustatory*: tea, rhubarb, cranberry, sassafras, citron. *Olfactory*: celery seed, caraway seed, myrrh, cedar, lemon. The following flowers may be here introduced: rose, violet, carnation. The odors of these should be taught from the fresh flower only. In this class speed and accuracy in recognizing and naming the substance used should be emphasized.

INTERMEDIATE I.

Review. Add the following: *Gustatory*: apple, banana, cherry, fig, date, olive, sweet pickle, sour pickle, raw turnip, raw carrot. Care must be taken that the pupil does not recognize these substances by their shape and consistency when taken into the mouth. Although this is a useful adjunct to the gustatory sense, it interferes with the result of the tests. As far as possible the substances should be cut into small pieces of the same shape, or else finely ground before using.

Olfactory: burning wood, gasoline, pine, sage, orris, bay, chamomile, benzoin, garlic.

The class should be taught the meaning of spicy, pungent and aromatic.

ADVANCED.

Review. The more delicate differences in taste and smell are to be learned by this class.

The following *gustatory* exercises may be introduced: lard, butter, olive oil, wheat flour, rye flour, corn starch, honey, maple syrup, New Orleans molasses.

Olfactory: lavender, sandal-wood, ginger, rosemary, thyme, vanilla, pennyroyal.

IV. TACTILE TRAINING.

What is commonly called touch is in reality a complex of several senses. Technically, touch is pressure-sense, but in every day life it is associated variously with muscle-sense, stereognostic sense, temperature-sense, and pain-sense. Each

of these senses has its own specific nervous mechanism. Pressure-sense gives us information regarding the condition of the surface of bodies (rough, smooth, etc.), and tells us something about their weight. Muscle-sense with the aid of pressure-sense enables us to estimate the weight of objects by lifting them. Stereognostic sense informs us as to the form of objects which are in contact with the body surface. This information is gained chiefly by handling the objects, the hands and the tongue being the chief organs of this sense. Temperature-sense has a double function, some nerve-endings registering sensations of cold, others of heat. Neither will give any other sensation, no matter how stimulated. Pain-sense informs us when stimuli of any sort become so vigorous that injury to the tissues may result.

KINDERGARTEN.

I. *Pressure-sense.* In this class the exercises in pressure-sense should be confined to the two sensations of *rough* and *smooth*. The objects needed are a black cloth bag (8 x 12 inches) with a drawstring, and two oblong wooden blocks (1 x 3 x 4 inches), one covered on all sides with coarse sandpaper, the other varnished and highly polished. The training should begin with the rough block. This should be placed upon the table, and the tips of the pupil's fingers rubbed over its surface by the teacher. At the same time the teacher should say: "The block is rough." The block should also be rubbed gently over the cheeks and lips, repeating always: "The block is rough." An attempt may then be made to have the child feel the rough surface without help. When the pupil has been well drilled in the sen-

sation of roughness, the smooth block may be used in a similar manner. Following this the two blocks may be used together. Rubbing the pupil's fingertips on one block the teacher should say: "This block is rough;" then rubbing the other: "This block is smooth." Finally the blocks may be placed in the black bag and the pupil required to select one of them at command. Thus the teacher says: "Give me the *rough* block." The child's hand is placed in the bag, taking care that the blocks are not visible to the eye, and the proper block recognized by touch and withdrawn.

II. *Muscle-sense.* The training of muscle-sense develops ability to recognize differences and similarities in the weight of objects. The objects for this exercise are three cubes (4 inches square) and three pyramids with square bases (4 x 6 inches). All the objects should be white. Two cubes and two pyramids should be drilled with a 1½-inch hole and loaded with lead (shot set in paraffin is best), and plugged, so that one cube and pyramid are of equal weight and heavy, and the other cube and pyramid of equal and medium weight. The third cube and pyramid are not loaded, but the cube is drilled and made of equal weight with the pyramid. There are thus three pairs of objects, the objects in each pair being of the same weight, but each pair differing decidedly from the others.

In beginning the work, the heavy and the light pair are first used. All four objects are placed upon the black felt square, and the child taught to grasp and lift them, one at a time. The teacher should do this by placing the child's

fingers around the object and holding them there, at the same time lifting the object and saying: "This is the heavy cube." "This is the heavy pyramid," etc. When the pupil is familiar with the objects, he should be taught to select the pair that are of *equal* weight, placing the pyramid of this pair upon its cube. The teacher should say: "Where is the *heavy* cube?" When it is found: "Put the *heavy* pyramid on the *heavy* cube," and so on until the exercise is perfectly familiar, and may be done equally well with each hand.

III. *Stereognosis*. (Omitted from this class.)

IV. *Temperature-sense*. The recognition of differences in temperature is trained by immersing the pupil's hand in water. Two vessels both exactly alike (white enamel cups holding about one pint are best) are required. One is to be filled with warm water (120 degrees F.) and the other with cold water (40 degrees F.). The pupil's hand is to be immersed first in the hot water, the teacher saying: "This is the *hot* water," then in the cold, the teacher saying: "This is the *cold* water." The hands are exercised alternately. When this exercise is well understood the teacher should say: "Put your right hand in the *hot* water," etc., continuing the exercise until the child shows that the difference between the two is recognized. The cups should be moved about from time to time; otherwise the child may select one of them by remembering its position. A third cup containing luke-warm water (98 degrees F.) may be introduced later, and the pupil required to differentiate the three degrees of temperature.

The association of temperature with common objects may be developed by pointing out familiar sources of heat, such as a burning candle or lamp, the stove, the radiator, etc., and common cold objects, such as ice, snow, etc.

V. *Pain-sense*. The training of this sense is omitted.

PRIMARY II.

I. *Pressure-sense*. Review, paying particular attention to clear understanding of the words *rough*, *smooth*. The concepts *hard*, *soft*, may be added in this class. The objects needed are an oblong block similar to those previously used, but unvarnished, and a small cushion of silk (about 1 x 3 x 4 inches) stuffed lightly with cotton. *Hard* and *soft* may be taught with these in accordance with the method used in teaching rough and smooth.

II. *Muscle-sense*. After reviewing the earlier work, with particular drill on the words *heavy* and *light*, the training may be extended to heavier objects. Four covered baskets (about 6 x 8 x 12 inches) with strong handles, all alike and green in color, are to be provided. These should be loaded with some suitable material (such as small stones) so that there is a distinct difference in their weights. The exercise may be commenced with the baskets loaded in two pairs, the baskets in each pair being of equal weight. This gives two different weights to be recognized by the pupil. The teacher says: "Bring me the *heavy* basket." The pupil selects a heavy basket from among the others and carries it across the room to the teacher. The child may then be required to select and carry two baskets of the same weight

(one in each hand). The baskets may then be loaded so as to give four different degrees of weight, the pupil thus being trained to recognize smaller variations.

III. *Stereognosis.* (Omit.)

IV. *Temperature-sense.* The class should review the previous work. Three more vessels are then to be introduced, making six in all. These should be filled in pairs, two hot, two luke-warm and two cold. The pupil is then to be taught to group the pairs, placing the two of like temperature together, the hot at one end and the cold at the other.

A beginning may be made in teaching the relation between a source of heat and a source of light. It may be shown that heat and light accompany each other, and that they are habitually found together.

PRIMARY I.

I. *Pressure-sense.* Review. The concepts of rough and smooth may be further brought out by using a piece of coarse burlap and a piece of satin (each about 4 inches square). A rough and a smooth stone may also be employed, the child learning that the qualities of rough, smooth and also hard, soft, are not inherent in any specific object, but may be possessed by various objects.

The concepts *wet*, *dry*, should be taught to this class. Two pieces of cloth (ordinary face cloths will do) one of which has been dipped in water, are to be used. The pupil must be shown that when anything is *wet*, water has been *added*

to it. The child should note that touching the wet cloth *wets the hand*. It should also be pointed out that when a thing is wet with water at the ordinary room-temperature it *feels cold*. This forms a correlation of pressure- with temperature-sense.

II. *Muscle-sense*. The early work is to be reviewed, the teacher varying the exercises by changing the weights of the baskets. The positive and comparative—heavy, heavier, and light, lighter—should be developed. The application of muscle-sense in the estimation of the weight of common objects may be introduced here, the pupil being directed to lift and compare the objects about the room.

III. *Stereognosis*. This work has not been previously introduced. The aim of the instructor should be to teach the pupil to recognize and name familiar objects by *feeling their shape*. Five objects are to be used: *i. e.*, sphere, cube, cylinder, pyramid, cone. (They should be small enough to be grasped readily in one hand). The black bag used in the pressure-sense training is to be employed here. A single object is first placed in the bag and the pupil's hand inserted, the draw-string being tightened around the arm. The child must recognize the object and name it without withdrawing the hand. The teacher may say: "What do you feel?" "I feel a cube." The pupil must not be permitted to recognize the objects by feeling them *through* the cloth of the bag. The hand must invariably be placed *within* the bag. When each object is readily recognized by the pupil with either hand, various combinations of three objects may be placed in the bag (always use three,

never two), and the pupil required to select and withdraw one named by the teacher.

IV. *Temperature-sense*. Review the earlier work. An additional exercise in temperature-sense may be introduced in the form of the shower bath. This stimulates and thus brings into activity the nerve endings of this sense throughout the whole body. The application of heat and cold to various parts of the cutaneous surface may also be employed, the child being required to state which stimulus is being applied. For this purpose a small cloth wrung out of hot or cold water may be used. The ability to recognize differences of temperature is not equally good throughout the body, and it will often be found difficult to obtain correct answers from pupils who are able to appreciate even slight variations in temperature by means of the hands. These exercises are of course not intended for the school-room. They may be given with the morning bath or at some other suitable time.

INTERMEDIATE II.

I. *Pressure-sense*. After reviewing the early work the concepts of *elastic* (or *springy*), *sticky* and *oily* are to be introduced. A small piece of India rubber sponge may be used for the first concept. The latter two are best taught by applying glue and olive oil to pieces of cardboard (about 6 x 6 inches), which are protected by a paper box or other suitable cover.

II. *Muscle-sense*. Review the previous work, introducing the three degrees of comparison: heavy, heavier, heaviest; and light, lighter, lightest.

III. *Stereognosis*. Review. The simple recognition of objects placed in the bag should be continued. Common objects may be added to those already in use, as follows: apple, glove, brush, fork.

In these exercises the pupil has been required heretofore to give the specific name of the object felt. To this may be added the recognition and description of the *shape* of the object. Spherical, cubical, cylindrical, conical, pyramidal, are to be taught, using suitable objects. Flat, irregular, thick and thin may also be given, employing pieces of wood of appropriate shape. Differences in size should next be brought out. This may be commenced by using two objects of similar form but different size, as two cubes, two spheres, etc. The pupil is to withdraw the *large* or *small* object at command. Later five objects differing both in shape and size are introduced into the bag, thus requiring a double differentiation. The exercises may be still further amplified by blindfolding the pupil and directing him to recognize and name common objects of furniture about the room by feeling them.

IV. *Temperature-sense*. Review.

INTERMEDIATE I.

I. *Pressure-sense*. Review all the earlier work. The following exercises are to be added, the pupil being taught to differentiate with readiness the sensations resulting from touching raw cotton, raw wool, raw silk, fur, feathers, velvet, wood, metal, stone, glass. All these are to be used in the cloth bag. It is to be noted that the above sense perceptions

are a complex of pressure, stereognostic and temperature sensations, the latter depending upon the property of some of the substances in question of absorbing heat from the cutaneous surface more rapidly than others.

The ability to recognize weight by means of pressure-sense should be brought out here. This is to be done by utilizing the weighted cubes and pyramids as they were employed in the early muscle-sense exercises, the difference being that instead of grasping and lifting the objects with the fingers, they are placed by the teacher upon the palm of the pupil's hand, the back of the hand resting on the table. In this way muscle-sensations are eliminated and the estimation of differences in weight is made to depend entirely upon pressure.

II. *Muscle-sense.* Review.

III. *Stereognosis.* Review. The pupil should be taught to recognize the following familiar objects: rubber ball, teaspoon, blunt scissors, button-hook, small doll, cup, whisk, flower, vase, leaf.

IV. *Temperature-sense.* Review.

ADVANCED.

I. *Pressure-sense.* Review. The following substances are to be recognized by pressure-sense: cotton cloth; woolen cloth; silk cloth; hair cloth; satin; burlap; tissue-paper; blotting paper; India-rubber sheeting. These materials should be employed in pieces of uniform size (4 inches square).

II. *Muscle-sense.* Review.

III. *Stereognosis.* Review. This class should be required to recognize the letters of the alphabet by touch. A set of twenty-six blocks (1 x 3 x 3 inches) should be provided. Upon one side of each of these blocks a letter of the alphabet is to be clearly outlined by deep triangular grooves. The pupil should first be taught to recognize the letters singly, then to select a specific letter from a group. As a variation of this the teacher may require a simple word to be spelled by withdrawing the proper letters from the bag in appropriate order.

Seven new geometric forms are to be taught in the usual manner. They are as follows: hexahedron (square prism); right-angled triangular prism; equilateral triangular prism; ovoid; ellipsoid; hemisphere; circular plinth.

IV. *Temperature-sense.* Review.

MANUAL TRAINING.

Manual work is of prime importance in the training of subnormal children. Much of it must of necessity be very elementary, and physical disabilities will often make the results exceptionally crude and imperfect. But the aim should be to accomplish results in the child, rather than in the work, and thus it is more important that the pupil do something of himself than merely get something done. All the various phases of the work should be taught with strict adherence to the purely objective method. When the pupil

is called upon to do or make something, he should perform his work without help if possible. If help is needed he should be *assisted* by the teacher. It is better to follow this method than to show the pupil how the work is done, permitting him to imitate. The teacher should never do the work for the child. *After* the task has been completed, the pupil should be shown a perfect specimen of the object, made previously by the teacher, and should be required to discover, and, if possible, remedy the defects of his own work.

As far as the work will permit, all manual exercises should be done with a model or pattern as an objective guide. This should be made by the pupil. Thus in making a peg-board, the pupil should first draw and cut out a model in card-board, and then, using this as a basis, proceed to make the peg-board itself.

KINDERGARTEN.

I. ELEMENTARY WORK. *Lifting and Placing Objects.* The objects necessary for this work are: 24 wooden cylinders (6 x 8 inches); 24 smooth stones as nearly spherical as possible, (cobble stones about 6 inches in diameter are suitable); 24 Roman bricks (2 x 4 x 12 inches). If desired these may be colored white, red and green, thus giving eight objects of each color in all three forms.

The exercises to be performed with these objects have a threefold aim. First the development of the voluntary muscles. For this purpose heavy objects have been selected, which can be handled only with both hands, and which require the exercise of the muscles of the back and shoul-

ders in lifting and carrying. The second aim is the development of muscular coördination which is favored by the exercise of the specific muscle-groups involved in grasping and lifting with both hands. The third aim is the stimulation of rudimentary constructive effort, which is aroused by the placing of the objects in lateral and vertical order.

The following exercises are to be performed by each pupil:

- a. Simple lifting of the object, using two hands.
- b. Carrying the object to a specified place.
- c. Carrying the object to a specified place and returning with it.
- d. Carrying two objects to the same place.
- e. Carrying several objects to the same place and placing them in a row.
- f. Placing two and later three cylinders one upon another.
- g. Placing six bricks one upon another.
- h. Placing four stones together in a square, with a fifth on top to make a pyramid.
- i. Placing two cylinders on end 6 inches apart, with a brick across the top.

It is to be noted that each of these exercises must be accurately and readily performed before another is undertaken. The colors should be used at first singly, then in combination.

Sand-work. A sand table with clean white sand and several small tin buckets, shovels and molds are to be provided for this exercise. The child should first be taught to fill

the sand bucket with dry sand, using the shovel (never the hands), and empty it again. The teacher may find it necessary to grasp and guide the pupil's hand at first. When this exercise can be done without help, simple figures may be molded with the hands in wet sand. A hemisphere, a conoid, and other easy forms may be taught. The pupil may then use the tin molds, filling them with the shovel, patting them down and turning them out on the bottom of the sand pan.

Block-building. As an exercise correlative with the lifting and placing, similar work may be done with blocks at the pupils' seats. The same figures may be built, using blocks of the same form and color as the larger objects. In early training a multiplicity of forms should be avoided, as this is apt to produce confusion in the mind of the child.

Pegboard-work. This work coördinates the hands and eyes. It develops perception, attention and memory. It is useful in encouraging quick recognition of form and color, and in training ready selection of one form or color from among many. The first exercise should be performed with a simple peg-board (8 x 12 inches), containing a single row of eight half-inch holes, with sets of pegs ($\frac{1}{2}$ x $2\frac{1}{2}$ inches) in white, red and green colors. The pupil should be taught to fill each hole in the board in consecutive order from left to right, using pegs of a single color only. This should be done readily without assistance, and with either hand. Combinations of red and green pegs may then be used, and finally white may be introduced. The peg-board serves also as a foundation for writing because it develops a basis

for the joining of dots with lines. In this work the peg-board should be supported at an angle of about 50 degrees on a framework or easel. (See *Language*.) The pegs may be put in from above downward and from left to right. A peg should be inserted at *each end* of the row first, the other holes being filled in afterward in the proper direction.

The second peg-board is to be given to the pupil only when the first is perfectly familiar. It consists of a board similar to the first, but containing two rows of holes. These are to be filled as before. When this can be done, the third board may be introduced. This contains four rows of five holes each, the five holes in each row being separated into a group of three and one of two. These rows are to be filled in a manner similar to the others. The three-plus-two group is presented here as a foundation for the training of the eye in the perception of number-groups. The aim should be to familiarize the pupil with this group, so that the recognition of 5 as 3 plus 2 will become automatic. The *three* may be filled with red pegs, the *two* with green and *vice versa*.

Sewing-board work. It is quite impossible for subnormal children of this grade to use successfully the small sewing-cards of the ordinary kindergarten. Exercises with the sewing-board are necessary as a preliminary training before anything so small as a needle can be handled. The board (4 x 14 inches) contains 25 1½-inch holes placed in five rows. These holes are reamed out so that all sharp edges are removed. Attached to the board is a piece of rope (¾ inch; 3 feet long), with a long (8-inch) rounded blunt

wooden needle at the end. The board is held in the pupil's lap, and the needle passed in and out of the holes, beginning at an upper corner, and passing downward along each row until the board has been covered. It may be necessary for an assistant to move the child's hands at first. The exercise is repeated until it can be performed without help. Other more complicated stitches are then introduced.

Weaving-board work. What has been said regarding the kindergarten sewing-cards applies also to the mat-weaving. The common paper or linen mats cannot be handled by this class. A weaving-board must be used instead. This consists of a framework (2 feet square), with straps of white webbing ($1\frac{1}{4}$ -inch), stretched from one side to the other, about $\frac{1}{8}$ inch apart. The frame is held before the child with the webbing directed vertically. A flat wooden needle (8 inches long), to which is attached a piece of webbing (26 inches long) is given the pupil, and he is required to weave this in and out from right to left, beginning at the top. When the needle has been passed all the way through, it is detached, and a second piece of webbing woven into the frame. This is repeated until the frame is filled. Color-patterns may be produced by using white, red or green colored webbing.

Braiding. This is a useful exercise in coördination. The apparatus consists of three pieces of soft white rope ($\frac{1}{2}$ inch; 18 inches long), fastened together at the upper end. This end should be slipped over a hook or made fast in some other convenient manner, and the child taught to braid the

three strands of rope. Colors may be introduced here as elsewhere, by using strands of colored rope.

Buttoning. Buttoning and unbuttoning are two of the most elementary duties connected with self-help. Many subnormal children cannot dress or undress themselves on account of the buttons. A strip of heavy cotton material is to be provided, along one edge of which are placed five one-inch buttons, 2 inches apart. The opposite edge should contain large button-holes. The pupil is to be trained to button and unbutton this strip, until the exercise can be performed easily and without help.

Knot-tying. Coördinate finger-work is well developed by this exercise. The material used should consist of a short length of $\frac{3}{8}$ -inch rope, in which the pupil is to be taught to tie simple and square knots. This work should not be taken up until the sewing, weaving and braiding are well performed.

II and III. PAPER-CUTTING AND FOLDING. This work should begin with simple folding. A square of heavy manilla paper (12 x 12 inches) is to be folded by the teacher so as to make a 6-inch square. This should be presented to the pupil, who is required to unfold and refold it along the same lines. This is to be repeated with help until the pupil can fold the paper readily. A fresh piece of paper should then be folded by the child without previous folding by the teacher. A large pair of blunt scissors is then given the pupil, and he is required to cut along the folded lines, the teacher holding the paper and assisting also with the scissors

if necessary. The scissors must at first be held with the thumb and all four fingers. If they cannot be grasped at all it may be necessary to make use of exercises with the elastic flexor glove. When the cutting is done, four 6-inch squares of paper will result. These should be mounted on a card or in a large book. Triangles and smaller squares may be attempted when the larger ones are readily made, and the exercises may be further varied by using paper of white, red and green colors. If the advancement of the class permits, simple picture-cutting should be commenced.

IV. DRAWING AND PAINTING. This work should begin with exercises on the blackboard, or on large sheets of heavy manilla paper. Chalk or crayon (white, black, red or green) may be used. The pupil must first be taught to hold the chalk. A small metal chalk-holder should be used for this, attention being paid to the proper position of the fingers. The first exercise consists in connecting several dots previously made by the teacher. A straight line is first drawn, next a broken line, then lines forming a square, a triangle, etc. When this point is reached, plain colors (black, red or green) may be utilized to cover the enclosed field. Crayon may be used, or if the work is done on paper a water color wash may be employed.

V and VI. Omit.

VII. CLAY-MODELLING. This should begin with the simple exercise of rolling a ball of clay between the palms. A new ball should then be made, and this should be pressed and patted gently upon the modelling-board until a cube is formed. In a similar way a cylinder, a pyramid and a cone

may be made. The objects should be marked, dried and preserved.

VIII. Omit.

IX. WOODWORKING. Woodworking should commence with indeterminate pounding. Each pupil is to be provided with a hammer of medium weight, and a log or block of wood about 8 or 10 by 18 inches stood on end for an anvil. The pounding should be rhythmic, the class keeping time with the instructor. The rhythm may be aided by introducing a little song. The pupil's arms are to be raised and lowered by an assistant if necessary. When indeterminate pounding is well accomplished, pounding upon a spot marked on the log may be attempted. If this is done successfully, nail-driving may be introduced. The pupil may also be given indeterminate cross-cut sawing, using a half-inch board clamped vertically in the vice.

X to XIII. Omit.

XIV. SEWING. In addition to the sewing-board exercises, simple stitching with needle and thread should be taught if possible. A piece of coarse, heavy burlap or crash about 8 inches square is to be folded down the center. A blunt bodkin 3 inches long, provided with a heavy thread, is inserted at the right-hand end of the folded edge, and the pupil required to carry a series of running stitches along the edge. Assistance is to be given as needed.

XV and XVI. Omit.

PRIMARY II.

The pupils of this class should be given the work of the kindergarten without change. Special attention is to be paid

to individual development. Somewhat better finished and more accurate work may be expected.

The *pegboard work* may be advanced by the introduction of boards 4 and 5. (These boards develop simple forms in a continued series. They include the right angle, double right angle, triangle, square and quadrilateral.)

PRIMARY I.

I. ELEMENTARY WORK. *Lifting and Placing Objects.* The earlier work is to be reviewed. Two new exercises may be added:

- j. Placing several cylinders six inches apart, with bricks upon them to form a bridge.
- k. Placing four cylinders together with bricks across the top to form a house.

These exercises may be done in the sand room. The objects and also the sand may be carried in a small wheelbarrow, the pupil being taught to load and unload them.

The class is to be taught to build the log cabins which are provided. (These are made from appropriate-sized pine sticks, ready cut and notched. They measure about 12 x 18 x 20 inches.) (See *Paper-cutting* for correlative work.)

Sand-work. In addition to loading and unloading sand in the wheelbarrow, the class may be taught to model in wet sand a rough outline of the grounds of the summer home in Maine. The House, Deer Lodge, the school-house and the gardens may be shown, together with a portion of the bay. Trees and shrubbery may be made of evergreen twigs.

Block-building. The Third and Fourth Gifts of Froebel

are to be used here, omitting the forms of knowledge and beauty in both Gifts.

Pegboard-work. The more complex pegboards may be used here. Boards 6 and 7 are to be introduced, using combinations of colored pegs (white, red and green), and correlating the groups thus formed with the elementary number-work. They include the quarter-circle, semi-circle, circle and ellipse. Board 7 presents the outline of a house, a tower and a wagon, all of which may be correlated with other work.

Sewing-board and Weaving-board work, Braiding, Buttoning and Knot-tying are all to be reviewed. The class may be taught to braid three-stranded raffia, using a large bundle of straws for each strand.

II. PAPER-CUTTING. In this work the following objects are to be made: a wagon, a simple house, and models of a peg-board and a key-rack (cf. woodworking; see diagrams). These are to be drawn, with assistance, if necessary, using a ruler (with no divisions into inches) to make straight lines, and cut out with the scissors. The following pictures are also to be cut out: a horse and a man (for the wagon), several persons (for a family for the log cabin). These objects are to be used in correlation with the lifting and placing work. The horse and wagon should drive across the bridge, and the family occupy the cabin, thus adding to the concrete idea of these objects and their use.

III. PAPER-FOLDING. Review. The class is to be taught to fold a napkin, a handkerchief, etc., neatly. Each pupil

is also to make a small blank-book (6 x 8 inches ; 20 pages), with cover. The paper must be neatly cut, the cover overlapping the leaves, and the whole punched at the back and tied with a narrow ribbon or a cord.

A series of objects is to be made, using the folded square as a basis. The paper should be bristol-board (white, red and green), cut in 12 x 12-inch squares. These squares are to be folded three times each way, thus making sixteen 3-inch subdivisions. This method of folding is to be adhered to closely, as it is correlative with the sixteen 3-inch blocks used in the objective number work. The following objects may be made: square box; oblong box; cubical box; comb case; match safe; table; chair. (See *Raffia and Reed Weaving*. Knapp. Milton Bradley Co. pp. 9 to 12). Some of these objects may be used as Christmas gifts.

IV. DRAWING AND PAINTING. After reviewing the early work, the curved line is to be introduced. This may be made at first by placing a circular object upon the paper and running the pencil part way around it. The curve may then be drawn from dot to dot, the dots being placed by the teacher. Combinations of curves, and the circle are next to be studied. Practice in using the plain ruler (without inches) and in drawing an accurate square should also be given. The work of coloring the drawing made should be continued.

V and VI. Omit.

VII. CLAY-MODELLING. After reviewing the earlier work, the class may make the following objects: an orange; an apple; a pear; a bird's nest; a flower-pot and saucer. (See

Forty Lessons in Clay-modelling. Kellog. A. Flanagan Co., pp. 11 to 17). A model of the peg-board (cf. woodworking) should also be modelled in clay.

VIII. Omit.

IX. WOODWORKING. The earlier work is to be reviewed. Pounding upon a given spot should be developed, and followed later by nail-driving and driving brass-headed tacks in figures. The teacher should provide samples of this work made by herself with which the pupil may compare his work. Sawing to a line (cross-cut and rip; $\frac{1}{2}$ -inch lumber; 18-inch line), indeterminate sandpapering, and boring should be introduced.

A small peg-board is to be made as follows (models of this must previously be constructed of cardboard and clay): the pupil is to cut a block of $\frac{1}{2}$ inch lumber 6 inches square. The teacher should mark dots (5 rows, 5 dots to the row), on the board and the pupil may then bore holes with an $\frac{1}{8}$ -inch gimlet nearly through the wood, following the dots closely. The board should be sandpapered and varnished. Match sticks may be used as pegs.

Key-rack. (A model should be made in cardboard). The pupil should cut and sandpaper a piece of $\frac{1}{2}$ -inch pine 4 x 12 inches. The teacher is then to dot nine points 1 inch apart along the center of the board. The pupil should insert small brass hooks at these points. Two screw-eyes are to be fastened in the upper edge of the board and a cord attached for hanging up. The rack should be varnished.

X to XII. Omit.

XIII. WEAVING. A number of strips of stiff colored linen (white, red and green) 1 inch wide and 20 inches long should be provided. Out of these the following objects should be woven: book-mark; napkin ring; picture-frame. (See Knapp, pp. 18 to 22).

XIV. SEWING. Review. In addition to the early work, drill should be given in the running stitch. A small black cloth bag (8 x 12 inches) with a tape draw-string may be made.

XV. Omit.

XVI. DOMESTIC EMPLOYMENT. The class should be taught to sweep the school-room, gathering up the dust with brush and pan and placing it in the proper receptacle, to place the furniture in order, and to remove the dust from it with a cloth.

INTERMEDIATE II.

I. ELEMENTARY WORK. *Lifting and Placing Objects.* The early work may be omitted. The class should devote its time to accurate and ready log-cabin building. Correlative with this a model cabin may be made of cardboard and of clay.

Sandwork. A mountain with a stream and bridge may be made in the sand-pan. Each pupil should draw a bridge on paper, and, if possible, make a simple wooden bridge in the carpenter shop.

Block-building. The Fourth and Fifth Gifts of Froebel are to be used by this class. The forms of knowledge and

some of the simpler forms of beauty may be developed. In the building of simple forms, attention should be paid to accuracy and dexterity. Originality in concept of form may be encouraged by allowing the pupil to invent new forms. These should be symmetric and should express a definite thought. Mere aimless play is not to be permitted.

Work with the *peg-board*, *sewing-board* and *weaving-board*, also *braiding* and *buttoning* are to be omitted. *Knot-tying* may be developed, the bow-knot being taught. The pupil should also be trained in wrapping and tying parcels.

II. PAPER-CUTTING. Review. Each pupil should draw a doll, following a dotted outline made by the teacher, and two sets of clothing. These are to be cut out and used with the log-cabin. The dolls should be of bristol-board; the clothing may be of lighter paper, colored black, red, green, blue or yellow. Paper chains may be made for Christmas decorations.

III. PAPER-FOLDING. After reviewing the earlier work, six additional objects should be made with the 12-inch folded square, as follows: lunch-box; hall-bench; sled; butter-dish; corner-shelf; side-shelf (See Knapp, pp. 12 to 14). Blank-books are to be made as in the previous class. Simple decorative forms in paper-folding may be introduced at the discretion of the teacher. Models also are to be made of the objects specified in woodworking (q. v.).

IV. DRAWING AND PAINTING. The work should begin with a review. The use of the plain ruler (without inches) is to be further brought out, and dexterity in drawing straight lines from point to point developed. A beginning

may be made in freehand drawing. The first models to be used are the cube and the wooden steps. These models are first to be reproduced in clay, and then drawn. The teacher should point out the effect of perspective and explain how it may be portrayed. This should not be done, however, until the pupil has made an attempt to draw the objects without help. A simple leaf should be drawn and colored. As an exercise in memory of form, the pupil may be required to draw a simple familiar object named by the teacher. This may then be colored, the pupil selecting and applying colors named by the teacher.

In color study a simple beginning may be made in the differentiation of standard colors from their *tints*. Red, green, blue, yellow and black are to be employed. It should be noted that the common classification of colors is very imperfect, being founded upon neither the spectrum color-scale, nor the physiological scale used in these exercises. The following definitions should be kept in mind by the teacher. A *standard color* is a pigmentary reproduction of one of the six colors of the spectrum. (The seventh spectral color, indigo, is omitted). A *hue* is a mixture of one standard color with another adjacent to it in the spectral scale. A *tint* is a mixture of a standard color with white. A *shade* is a mixture of one with black. Two colors are *complementary* to each other if they produce white when combined. The terms *primary*, *secondary* and *tertiary* should be discarded.

V and VI. Omit.

VII. CLAY-MODELLING. Review. The following objects

are to be added: cup; pitcher; tumbler; tray and basket; leaf; vase with two handles; tea set and tray; log-cabin. Delicacy and perfection of form is to be brought out as far as possible in this class.

VIII. Omit.

IX. WOODWORKING. Review. Planing should be introduced here. The following objects are to be made in addition to those of the previous work: wooden tag ($1\frac{1}{2} \times 3$ inches; $\frac{1}{4}$ inch wood; tapered at one end with $\frac{1}{4}$ inch hole in narrow end; well sandpapered; with corners and edges rounded; varnished); match-scratcher, (4×6 inches; $\frac{1}{4}$ inch wood; $\frac{1}{4}$ inch hole in center of one 4-inch side; 3×3 -inch piece of sandpaper glued to lower half of board after varnishing); calendar, (4×4 inches; $\frac{1}{4}$ inch wood; $\frac{1}{4}$ inch hole in one corner; varnished; small calendar glued diagonally in center); corner bracket; doll's chair and bench; (See diagrams for specifications of these objects). Card-board models of all of these objects should be made by the pupil before the wood-working is done. The teacher should have samples of the work made by herself with which the pupil can compare his own productions.

X. Omit.

XI. RAFFIA-WORK. Each pupil should braid a quantity of three-strand raffia, using stout full strands. Several colors may be braided separately. The pupil should be watched so that the braid is kept of uniform width. It is well to have a short section given to each pupil as a pattern. After sufficient braid has been plaited, a small oval mat

(6 x 9 inches) may be sewed, using a very heavy needle threaded with fine raffia. A simple basket should then be made.

XII. Omit.

XIII. WEAVING. Review the earlier work. Five new objects may be woven with the linen strips, as follows: cubical box; round box; oblong box; box with handle; box with lid. (See Knapp, pp. 22 to 24).

XIV. SEWING. The class should be made thoroughly familiar with the materials necessary for plain sewing, such as needle, spool of thread, thimble, scissors, etc. Very simple exercises in drawing and cutting out paper patterns, and in cutting material according to them may be introduced. The following stitches may be taught: running; basting; overhanding; outline-work; darning (a hole is to be cut in heavy canvas and the pupil required to darn it); sewing on patches; mending ripped seams. The girls are each to make a duster, a pin-cushion; a bureau set; and clothing for a doll.

XV. EMBROIDERY AND KNITTING. The bureau set made by the girls may be embroidered in a simple pattern. The girls should be taught a simple knitting stitch, and should knit a small face-cloth. The boys are to knot a doll's hammock (8 x 20 inches).

XVI. DOMESTIC EMPLOYMENT. The girls are to be taught to air and make a bed; to dust and place a room in order, and to set and clear a tea table. They may be per-

mitted to have afternoon tea once a week. The boys should learn to sweep and place a room in order.

INTERMEDIATE I.

I. ELEMENTARY WORK. This work may be reviewed at the discretion of the teacher. The log cabin and the Fifth and Sixth Gifts of Froebel may be used.

II. PAPER-CUTTING. Review. Koch's toys may be utilized as a form of busy-work, and more complex exercises in cutting out objects added. (See Bradley's "Cuts and Curves," Moran, etc.). Models of the girls' work-basket and the boys' cup-rack should be made. (See woodworking).

III. PAPER-FOLDING. Review. Four new objects may be made from the folded square as follows: carriage; house; stove; trolley car. (See Knapp, pp. 15, 16, 28, 29). Additional decorative folding may be introduced.

IV. DRAWING AND PAINTING. After reviewing the earlier work, add three models for freehand drawing: the cube, cylinder and pyramid. In amplification of the drawing from memory, the pupil should be asked to reproduce from memory, both as to form and color, objects selected by himself. A beginning may be made in freehand drawing from nature. A single flower (pansy) should first be sketched and colored, then a group of three leaves tied together with a ribbon. The teacher should prepare specimens of the work with which the work of the pupil may be compared. The flower and leaves should previously be modelled in clay. As an exercise in busy-work the pupil should be given a piece of paper upon which the teacher has drawn a simple

geometric figure, such as a circle, square, etc. This is then to be amplified and modified by the child to form a common object. Any object which suggests itself to the memory or imagination of the child may be used. Thus the teacher may present a square and say: "What will you make out of the square?" The child may say: "I will make a house." A door, windows, roof, chimney, etc., are then to be added by the pupil without help. After the drawing is completed, it may be criticised by the teacher. (Compare Drawing Cards, Series I).

In color-work the production of *shade* is to be studied. Mixtures of black with other colors should be made and compared with tints. The effect of sunlight in producing a tint and of shadow in forming a shade may be noted. The various tones of gray are also to be studied. A color scale may be made, commencing with a standard color, which is placed in the center, and carrying the color tints toward white on one side and the shades toward black on the other. The standard colors orange and violet should be introduced. A beginning may be made in the analysis of color harmony. Contrasted and dominant harmonies may be studied.

V. PHOTOGRAPHY. The elements of photography may be taught to this class. Instruction should be given in the use of the kodak. The "finder" should be explained, and its use taught; the rudiments of focusing should be made clear, and instructions given as to the intensity and proper direction of light. The general principles of the camera and of the action of light on the photographic plate may be explained.

VI. PYROGRAPHY. The mechanism and use of the pyrographic apparatus is first to be explained. The pupil may then be taught how to make straight and curved lines, how to control the depth and direction of the lines, and how to follow simple designs in outline. Plain backgrounds should be studied. Finally a simple Christmas gift should be designed and finished. In operating the compressed air, the foot-treadle should be used as well as the hand-bulb, on account of the training which it gives in complex muscular coördination.

VII. CLAY-MODELLING. Review. The following objects may be added: an apple with a leaf; a bunch of grapes; cherries. These may be colored appropriately, after they have dried. Models of the flowers and leaves used in painting are also to be made.

VIII. POTTERY. A horizontal revolving table is to be provided for this work, together with appropriate clay and tools. After the pupil has learned to operate the table and understands the use of tools, a bowl, a platter and a flower-pot may be made. Attention should be paid to perfection in symmetry and form. When suitable specimens have been made they should be burned and preserved.

IX. WOODWORKING. Review. The class should learn how to saw a curved line and how to use the spoke-shave. The girls of the class should make a wooden work-basket. The boys may make a cup-rack. (See diagrams). The objects should first be modelled in cardboard. Neatness and care should be emphasized in this class.

The class is to unite in making a doll's bed-room. This should be 2 x 2 x 3 feet in size, with one side open. A door and windows are to be cut, and everything contained in the room, including carpet, furniture, ornaments, linen, etc., is to be made by the children.

X. Omit.

XI. RAFFIA-WORK. The early work should be reviewed and two new objects added: a circular basket with flat bottom and lid (6 inches in diameter); a doll's sailor hat (4-inch crown 1½-inch brim). (See Knapp, pp. 101, 102). The introduction of color-patterns may be commenced here.

XII. BASKETRY. The elements of reed-weaving should be taught. A light-weight reed should be employed. The pupil may begin with heavy cord as a weaver, continuing its use until some dexterity has been attained. Two objects may then be woven: a circular mat; a small basket. (See Knapp, pp. 66 to 68).

XIII. WEAVING. After reviewing the earlier work, the hand-loom should be introduced. The teacher should insist upon care and neatness. During the year each pupil is to weave a face-cloth; a doll-rug; a lamp-mat.

XIV. SEWING. Review. Button-hole stitching, felling, and feather-stitching are to be taught. The girls are to make the articles necessary for their wooden work-baskets and for the doll's bed-room.

XV. EMBROIDERY AND KNITTING. Review. Each girl should embroider during the year a simple shirt-waist pattern.

XVI. DOMESTIC EMPLOYMENT. The earlier work is to be reviewed, attention being paid to daintiness, neatness and artistic arrangement. The girls should be made familiar with the service of a course dinner, setting and clearing the table and arranging artistic table decorations.

ADVANCED.

I. ELEMENTARY WORK. A review of selected portions of the earlier work may be given. The Fifth and Sixth Gifts of Froebel should be used, attention being paid to architectural forms. The class should be required to repeat the log-cabin work and to construct out of small stones and mortar a stable, a well and a church. The pupils may be separated into three groups, each of which should undertake the construction of one of these objects. The stable is to consist of three walls ($8 \times 18 \times 2$ inches), the front remaining open. A manger should be set in, using small sticks, and one window made. The roof should be of beams (small sticks of uniform size) thatched with grass. The well should be circular (diameter 12 inches; walls 6 inches high, 3 inches thick). A stone support with a wooden upright and a dipping-pole are to be added. The church should be simple, with peaked roof and a steeple at one end. (Size: 18×24 inches; 12 inches to eaves; steeple 30 inches). There should be seven windows and one door. The roof should be of board, tiled with red cardboard tiles (1×2 inches, rounded at lower end).

II. PAPER-CUTTING. Review. Cutting to measurement, using the 12-inch rule, should be introduced. Cutting out

and pasting decorative figures may also be utilized. A waste-basket; bench; paper-rack; tray; tea-pots and silver-holder should be made by the pupils as models of the work assigned to them in woodworking.

III. PAPER-FOLDING. Review. Folding to measurement is to be taken up here, using the 12 x 12-inch cardboard square. The following objects should be made: bill-holder; corner bracket; folding box; tabourette; chair. (See Knapp: pp. 77, 80, 84, 88, 94).

IV. DRAWING AND PAINTING. The class should review the earlier work, selecting material at the discretion of the teacher. Freehand drawing from models should be amplified by adding the sphere and cone, and using the models in groups. The teacher should prepare good drawings of the objects which are to be shown to the pupil for comparison with his own work, *after* his work is completed, but never before. The pupil must first make an effort to draw the object; the teacher may then correct whatever errors are made. Reproduction of color, using colored patterns (sections of well-colored wall paper of formal design will serve) should be taught. Sketching from nature is to be commenced, and studies of objects in nature and simple landscapes made in charcoal and crayon. The latter may be used in three colors. A beginning may be made in copying good pictures.

As an exercise in busy-work, the development of drawings based upon geometric figures may be continued. (Compare Drawing Cards, Series II).

In color-work a thorough review is first to be given.

This should be followed by a study of *hue*, introducing two hues between each pair of standard colors. The pupil should make a color-chart, (using "Back Bay" colored papers), containing two shades and two tints of each standard color and its two hues. The meaning of color *value* and *intensity* should be explained. Broken colors may be introduced and their relation to tints and shades shown. Complementary and analogous harmonies should be taken up, and the relation of color value to harmony pointed out. The application of these simple points in mixing pigments may be made.

V. PHOTOGRAPHY. Review. The elements of *composition* should be explained. The value of high and low lights may be shown and practice given in estimating accurate exposure-time.

VI. PYROGRAPHY. Review. More complex designs should be executed, colored stains being introduced. A beginning should be made in the execution of simple original designs. During the year five objects are to be made by the pupil. (See woodworking for a portion of this work).

VII. CLAY-MODELLING. After reviewing the earlier work, the pupil should model a doll and a small dog. The following objects are to be made, using plaster-of-paris casts as models: human hand, foot, human face in profile (on a plaque).

VIII. POTTERY. Review. In addition, the following objects should be made: vase, bowl, pitcher, stein. One of these objects should be colored with a simple design and glazed.

IX. WOODWORKING. The following objects are to be made by the class: pupils No. 1 and No. 2 (see key for these numbers) should make a large hall bench (to be decorated with a pyrographic design); No. 3 and No. 4; a set of three tea-pots. Each boy is also to make two small objects in review of the earlier work. No. 5, No. 6, No. 7 and No. 8: scrap basket with stencilled design sawed out along top; No. 5 and No. 9: paper-rack; No. 9: silver-holder; No. 10: tea-tray with handles.

X. METAL-WORKING. This work may be introduced as a pastime. A brass foot-rule should be cut and marked, and a pint measure made. The pupil should be taught to solder a simple joint. Other objects in brass are to be made at the discretion of the teacher.

XI. RAFFIA-WORK. Review. Two new objects are to be added as follows: wall-pocket; shopping bag. (See Knapp, pp. 103, 110).

XII. BASKETRY. After reviewing the earlier work, two new objects should be added: basket (using border II); basket (using border III). (See Knapp, pp. 68, 69).

XIII. WEAVING. Review. Each pupil should weave a mat upon the hand-loom, introducing a pattern in five colors.

XIV. SEWING. In addition to a thorough review, the pupil should cut out and put together a shirt-waist which has been previously embroidered.

XV. EMBROIDERY AND KNITTING. During the year a shirt-waist pattern should be embroidered. The pupil should also knit a pair of bedroom slippers.

XVI. DOMESTIC EMPLOYMENT. Review. The pupil should be taught how to prepare the table for all meals; how to prepare one or two simple salads; how to make coffee; boil an egg; make toast; prepare fruit for eating. Instruction should also be given in cleansing laces and woollens.

MENTAL TRAINING

I. MEMORY-WORK.

The development of memory is a most necessary part of the training of subnormal children. Various factors combine to produce defective memory. In addition to sensory defects, attention is often poorly developed and association is frequently at fault.

Memory of course is exercised by the training of the special senses. In this, however, the aim is to develop principally the actual sense-registering apparatus. In the memory-work the aim should be to develop abstract memory, particularly in its relation to association. Three points should be kept in mind: first, the attainment of speed and accuracy in memorizing; second, the attainment of speed and accuracy in reproducing from memory (or in "remembering"); third, fullness and readiness of association. A part of the work should consist in teaching the children the commonplace things of every-day life (such as saying "good morning," "please" and "thank you," rising when a lady enters the room, etc.). These things should be so readily remembered that they become reflex or automatic, and fall into the class of so-called "native reactions."

KINDERGARTEN.

The pupil is first to be taught to find his own chair, stand before it, say "Good morning," be seated and fold the hands. This may not be an easy task, but it should be persisted in until accomplished.

The child should then be taught to perform some act which requires an effort of memory and necessitates some simple associative process; for instance, he should be directed to cross the room (or go to another room), and return with an object which is to be used for some specific purpose. The *purpose* in the exercise is important. No child should be permitted to perform an exercise without being shown clearly *why* the object was brought, or what it was *for*. Thus the teacher may have a box, the pupil being required to bring the cover for it. A bottle and a cork may be used, or a pen for the ink, or a pad of paper for the pencil, etc. These exercises bring out valuable associations. They are to be supplemented by training in the recognition of common things and their use. This is to be directed in this class particularly toward self-help. The pupil should know: hat, coat, dress, stockings, shoes, and if possible other articles of clothing. Also: soap, towel, tooth-brush, hair-brush, comb.

In this work (and in fact in much of the other training) rewards are useful. An apple or an orange may be given as a reward to a pupil who has done well. The child may be required to go and get the orange which he has earned from another room, or one pupil may bring an orange as a reward to be given to one of the other children. These rewards

must be used with discretion and not given too frequently.

The motion song, "This is the Way the Lady Rides," is particularly pleasing to pupil No. 4, and may be used as a reward for her, and also, if advisable, for others of the class. Care must be taken not to bounce the children too hard. The song is also good training, and may be learned by the class. Each pupil should repeat the motions (and words if possible) using a doll, until they are perfectly familiar.

PRIMARY II.

The earlier work should be reviewed. The training in remembering the names and uses of common objects should be amplified by adding: handkerchief, gloves, overshoes, necktie, hair-ribbon, napkin, plate, knife, fork, spoon, tumbler.

Each pupil should be provided with a rag doll (about 18 inches in height) and five sets of clothes in the colors red, green, blue, yellow and white. The girls should have girl-dolls, the boys boy-dolls. The suits must be complete, including underclothing, and must be properly made with buttons, etc. Each doll is to have a small green doll's chair, and a crib may be provided for the class as a whole. The pupil is to be taught to dress and undress the doll, selecting the appropriate garments, to prepare the doll for bed, place it in the crib and sing or rock it to sleep.

PRIMARY I.

Review. This class should be given a daily drill in conduct. The little points of etiquette which every child should

know are to be emphasized, such as to say: "Good morning, Miss B." (using the teacher's name); to rise when the teacher or visitor enters the room; to shake hands; to offer a visitor or a lady a chair; to go behind a person in passing; to say "I beg your pardon" and "excuse me" at appropriate times; to say "What, Miss B.?" and "Yes, Miss B." instead of merely "What?" and "Yes" or a nod of the head.

Each child should be taught to know his own full name; his home; where he lives at school in winter and summer; the names of father, mother, sister, brother, etc.; the family photographs.

The pupil is also to be trained in recalling and naming the articles of food served at the previous meal. This may be amplified by requiring the naming of the food served at a meal on the previous day.

The memorization of a four-line stanza may be added to the other work in this training.

INTERMEDIATE II.

Review. The training in conduct should be amplified. More complex exercises in the recollection of objects seen and heard may be introduced by requiring the pupil to go into another room and describe on returning all that was seen there. Trips to town and other outings should also be described from memory. The aim should be to get as perfect a "word-picture" as possible, so that the child's reproduction of memory impressions may be truly graphic. It must be remembered that imagination should not be allowed to play any part in these descriptions.

INTERMEDIATE I.

A review of the earlier exercises is to be given, more thorough and complete work being demanded of the pupil.

The following exercises in sequence, which are supplementary to the sense-training, are then to be introduced. The words: cat, rat, hat, mat, bat, are to be written rapidly on the blackboard in a given order from left to right. They should be allowed to remain for a few seconds, and are then to be erased. The pupil must at once repeat the words in the order in which they appeared. The reply should be at first oral. Later it may be written, the whole class performing the exercise at the same time. When this can be done readily, the words may be written in a vertical series and the drill repeated.

In a similar manner the following sequences are to be taught: a, e, i, o, u—1, 2, 3, 4, 5—2, 4, 6, 8, 10—1, 3, 5, 7, 9—4, 6, 8, 10, 12—3, 6, 9, 12, 15.

ADVANCED.

Review, amplifying the exercise of naming objects seen in another room.

The studies in sequence are to be increased by the addition of the following: man, dog, tree, rain, girl—John, owl, pen, Maine, door—run, eat, make, ask, go—3, 6, 9, 12, 15—2, 5, 8, 11, 14—4, 7, 10, 13, 16.

As a drill in natural sequence, the following may be given: spring, summer, autumn, winter—seed, sprout, plant, flower, fruit. Also the days of the week and the months of the year. These sequences are fixed and not variable sequences,

hence their order should be changed only to give the pupil an opportunity to point out and rectify the error in sequence.

During the year the class is to become sufficiently familiar with a number of good humorous stories (not less than 5) that they may be told at the table or elsewhere with clearness and point.

The portraits of ten famous persons are to be made thoroughly familiar to each pupil: Plato, Raphael, Beethoven, Washington, Victoria, Roosevelt, Taft, Emerson, Alcott, Weir Mitchell.

Every week five current events are to be told to the class by the teacher, and each pupil required to tell the full story of the event in clear and intelligible form. These events are to be noted upon the blackboard (one added each day), and are to remain there for the entire week, the class being given a daily drill in their fluent narration.

II. ARTICULATION.

This work includes all those exercises which are necessary in developing the functions of voice and speech. It is closely related to the course in language, in fact in the higher grades it includes much of the material commonly placed in the latter course.

The development of speech is frequently the most difficult problem to solve in the training of subnormal children. It may take years to obtain even a single conscious expression of an idea in definite and intelligible vocal form.

The first necessity is of course control of the breathing

apparatus and of the facial, lingual, laryngeal and other correlated muscles. The voluntary control of voice-production is next to be acquired, and finally this is to be perfected by developing the cerebral vocal speech center and coördinating it with the centers of auditory, visual and graphic speech.

KINDERGARTEN.

Breathing exercises are to be used daily in this class. The pupil should be taught to inspire and expire at command, to "hold the breath," to breathe through either the nose or mouth at will, and to vary the rate and force of expiration. The muscles which are to be developed particularly are the muscles of the abdominal wall, the diaphragm, the intercostals and the group of muscles of the neck, shoulders and chest which are active in forced expiration. The wet spirometer may be utilized as an aid in expiratory exercises; small toy rubber balloons may also be employed. Voluntary expiratory effort may be obtained by having the pupil *blow* something. A feather, some white powder (cornstarch or talcum), flower-petals, little shuttlecocks of red or green tissue paper, cards bent at an obtuse angle and stood on edge, soap-bubbles, a lighted candle, all of these may be used in this exercise, the purposeful effort and its visible result aiding considerably in eliciting a response from the child.

In developing the facial muscles, the first exercise should be an attempt to have the pupil form a round aperture with the lips, like an "O." The attention of the child must first be secured by talking to him; the teacher should then

form a soundless O with her own lips, and endeavor to have the child imitate her. She will probably find it necessary to mold the child's lips into the required position with her fingers. She may use a round stick or other suitable object introduced between the lips to aid in this. The child's fingers should also be passed over the teacher's lips, so that their conformation may be tangibly perceived. Results are hastened in this work by the use of a mirror, the pupil being thus enabled to see his own lips, and to become conscious of their movements. When this exercise is performed by the child, an attempt may be made to elicit the vowel sound *ōō* (as in mood). The vibration of the teacher's larynx should be felt by the child with the tips of the fingers, the teacher at the same time calling attention to the pupil's larynx by placing her finger-tips over it. She may transmit the vibration also by pressing her cheek lightly against the child's. When this vowel-sound is learned the other vowels may be taught. Thus *a* (as in father) may be introduced following the jaw-dropping exercise (see below). The consonant *m* is often easy to teach at an early stage. It is to be noted that whatever sounds the pupil attempts voluntarily should be at once utilized for further development, no matter what they may be.

Exercises in dropping the lower jaw are very important. It is often difficult to obtain this movement. It may be taught very satisfactorily by using an ordinary glove-stretcher as a pair of "forceps," to pry the mouth open. (They should be frequently dipped in an antiseptic solution when in use). This must be done very gently. The pupil will eventually become so familiar with the "forceps" that

the mouth will be opened as soon as the teacher holds them in position.

The tongue is to be exercised by protrusion outward, upward, downward and laterally, and by retraction. The teacher should begin by drawing the tongue forward with her fingers, using either a pair of blunt tongue forceps or a piece of sterile gauze. After repeated traction and retraction, the tongue may be drawn up, down and laterally. These manipulations should be continued until voluntary performance of the required movements is obtained.

PRIMARY II.

Review, paying special attention to breathing at command and to tongue gymnastics. In these exercises the following may be added: curving the tip of the tongue backward, and at the same time upward, downward and laterally; touching the tip to the teeth and hard palate; rapid oscillation of the protruded tongue.

In the training in vocalization, the *Pollard system* is to be followed closely. The first family to be studied is the *at* family, using the words bat, cat, fat, hat, mat, pat, rat, sat. As a supplementary training the *Physiological Chart* of Makuen is to be employed.

PRIMARY I.

Review. The Pollard and Physiological systems are to be continued. The class should have daily drill in six words, which are to be selected from the reading lessons and placed upon the blackboard. These are to be made perfectly familiar. During the year the pupil should also learn a short

recitation, a song, a passage from Scripture, and a selection from the Collect. The pupils are also to be taught a brief dialogue (an Æsop's Fable or an extract from the Brownie Primer) and the class may join in a simple pantomime and a tableau (from the Brownie Primer). The latter is introduced for the purpose of developing bodily and facial expression. These are most important adjuncts to vocal expression, and should be drawn out as often and as much as possible.

INTERMEDIATE II.

Review. The work of this class should be similar to that of the previous grade. The Pollard and Physiological systems are continued. Drill should be given in rapid and clear enunciation. Attention should also be given to inflection and to the proper pronunciation of words.

This class should be given the customary review of words on the blackboard; a recitation; a Scripture passage; a selection from the Collect; a dialogue; a pantomime; and a little play. Very particular attention should be directed here to the interpretation of *ideas* by bodily and facial movement. (See Physical Culture).

INTERMEDIATE I.

The early work should be reviewed and the exercises continued along similar lines. Accuracy in pronunciation is to be especially emphasized in this class, particularly regarding proper vowel-sounds and the distinct enunciation of final consonants.

The following words will serve as examples of the form

of drill to be given: (*a* as in *father*) ask, path, hand, sand, land, etc.; (sound final syllable; *e* as in *tell*) vowel, towel, trowel, etc.; (sound final *ng*) going, doing, tugging, etc.; (sound final *w*) pillow, fellow, hallow, wallow.

During the year the following maxims and proverbs are to be learned:

Know by doing and do by knowing.

Waste not, want not.

Where there is a will, there is a way.

Constant dropping wears away the stone.

There is always a lion in the way of the lazy.

Do not cross the bridge before you come to it.

ADVANCED.

Review. The class should be given frequent drills in the pronunciation of words containing silent letters. For example: talk, walk, chalk; half; palm, calm, psalm; lamb, comb, bomb; right, might; straight, weight; laugh, draught, etc.

Recitations and action-plays similar to those given in the former grade, are to be taught to this class. A beginning may be made in the expression of *emotion* by bodily posture and movement.

A phrase in Latin, in French and in German is to be taught, as follows:

Mens sana in corpore sano.

Bon jour, bonne œuvre.

III. LANGUAGE.

Language-work is based upon the exercises in articulation. It comprises (a) reading, (b) writing, (c) spelling, and

(d) composition. These are all taught together, as it is impossible to separate one from the other in elementary work. Letter writing is included in section (d), and section (e), Foreign Languages, is omitted from this course (except for the few phrases in articulation).

KINDERGARTEN.

Very little can be done in this class that may be called work in language. Most of the work is included in articulation. The following words should be written on the blackboard and repeated to the pupil many times daily, an attempt being made to have him imitate: dear mama, (and the first name of the child).

An object (or picture) may be shown the child and the name of the object repeated and spelled and written (in printed letters) on the blackboard many times. This exercise should be continued even if no result appears to be gained. The mere repetition of the words and letters will have some effect. The following objects are to be used: white dog; black pony; red rose (with green leaves).

The preliminary work in writing consists of peg-board exercises, which train the pupil in the "dot-to-dot" method. The natural directions in the movements of the child's hand are from above downward, from left to right and away from the body. For this reason the peg-board, and later the paper, should be supported before the pupil at an angle of about 50 degrees by a suitable framework. For the same reason it is advantageous to commence the writing itself on the vertical blackboard.

The first exercise in writing consists in grasping and hold-

ing the chalk or crayon properly with the hand. It may be a long time before the pupil will comprehend this preliminary act. The teacher should place the chalk or crayon (whatever is used must be large and easy to grasp) in proper position in the child's hand and hold it there by enclosing the hand in her own. She should then guide the pupil's hand, joining dots previously made by her to form the following letters: A, M, E, D, R (and whatever letters are necessary to spell the child's first name). These letters should be large (at least 3 inches high), and should invariably be in the form of printed capitals. (See diagram). They are to be studied separately in the order mentioned above, repeating each letter until it is familiar. They may then be combined to form the three words to be learned by the class. These exercises should be utilized in writing letters home. As far as possible the letters should be written without help, even if very crude results are gained. This is a very important point. Whatever help is given should be carefully noted on each letter which is sent to the parents.

PRIMARY II.

This class should review and continue the work of the previous class. Attention should be paid to work without assistance. The full name of the child may be taught, and the words: apple, orange, cow, cat, illustrated objectively in the oral spelling.

The letters necessary for the child's full name are to be added to written spelling, and a beginning made, if possible, in teaching script letters. Letter-writing is to be included.

PRIMARY I.

The work of the first two classes may be reviewed at the discretion of the teacher. The words learned in the Pollard and Physiological systems are to be reviewed on the blackboard as in the class in articulation. Two primers are to be used in reading, *Hall and Brumbaugh*, and the *Brownie Primer*. The pupil must be required to gain an intelligent understanding of each word before another is learned. When a new word is reached it should be pronounced, written, spelled and defined by the teacher. The child should then express in some active way that he understands the word. He may then read, write and spell it himself. The small blank-book made in the manual room should be used as a writing book. The words and sentences learned, and the new sentences composed by the pupil are to be copied in this book, pictures being cut out and pasted in to illustrate the text. An original reader will thus be made by each pupil. Letter-writing as far as possible without help is to be given to this class.

INTERMEDIATE II.

A blackboard review of all words learned, both in this work and in the articulation class, is to be given daily.

The Brumbaugh and Brownie Primers should be continued. In addition the story of *Peter Rabbit* is to be read to the class. Each pupil must be made familiar with three Æsop's Fables and five Mother Goose stories. These stories are to be told or read aloud by the teacher. The pupil must learn to tell each story in his own words, to finish it if

begun by the teacher, and to write a little composition about it. He must also be able to write a little description of what he reads in the primer.

The writing books are to be kept for these compositions. Each child may choose whether he will have his book a Brownie book or a Rabbit book. The appropriate compositions are then to be copied and illustrated as they are written.

The class is to learn the days of the week and months of the year. The customary letter-writing is also to be done.

INTERMEDIATE I.

Review. This class is to study the *Thought Reader* (Book I) and after it *All the Year Round* (Spring). The usual review of words is to be given.

A composition is to be written once a month. The material for this should be procured from *Fairy Stories Every Child Should Know*. The teacher should read a story to the class until it is perfectly familiar, each pupil must then write out a brief paraphrase as a composition. This exercise should be insisted upon, even if the pupil is unable to write more than a few lines or words.

Elementary grammar may be introduced in this class. The pupil is to be taught the meaning of a *noun*, an *adjective* and a *verb*. The pupil should be capable of recognizing these parts of speech whether they occur alone or in a sentence. Proper nouns are to be distinguished from common nouns, and the comparison of adjectives explained. As an exercise, sentences should be written on the blackboard by the teacher, from which a noun, adjective or verb has

been omitted, the pupil being required to supply an appropriate word to fill the blank space. Practical application may also be made of this grammar in the reading, composition, letter-writing and other similar work.

A few of the elementary rules of punctuation and capitalization should also be explained, and exercises in them given to the class.

ADVANCED.

Review. The reading-books to be used in this class are *Old Greek Stories* (American Book Co's Eclectic Readings); Lamb's *Tales from Shakespeare*; and Gibson's *Sharp Eyes*. In reading, particular attention is to be paid to correct interpretation and inflection. The pupil should be drilled in ease of posture, fluency of utterance, directness of delivery, and clearness of expression.

Written descriptions of personal experiences and of stories read are to be required. Exercises should be given in paraphrase, particularly the conversion of poetry to prose. Compositions should be required monthly, and the usual home-letter written weekly.

In spelling, the words met with in the texts of the reading-books are to be utilized. The daily blackboard review should be continued.

Grammar is to be amplified by the introduction of a study of pronouns, adverbs, prepositions, participles, articles. These are to be well understood and readily recognized in any easy context. The pupil should be required to formulate sentences containing words selected by the teacher, and to

supply words omitted from sentences. Simple declension and conjugation should be introduced, and more advanced instruction in punctuation presented.

IV. NUMBER-WORK.

The development of the concept of number is a particularly difficult part of the training of subnormal children. Many such children find the abstractions of number almost entirely beyond their grasp. It is necessary therefore to present the subject in as objective a form as possible.

The method outlined here is based upon the fact that the *many* result from a breaking up or division of the *one*. The child has already gained a notion of the difference between *self* and the *other*; he has grasped the difference between *subjective* and *objective*. He has also formed some idea of a *thing*, of a vague *one* or *whole*, undefined as to parts. The first process in the study of definite number is therefore *analytical*. The concept of a *whole* and its *parts*, and of their relation to each other is first to be introduced. The fact that a *one* or whole may consist of several small *ones*, each a whole in itself, but a part as related to the primary unit, should be brought out. The synthetic antithesis, that the parts may be combined to form a whole is then to be demonstrated. Following the concept of *how many* into its more complex abstractions, the four primary operations may be taught.

Division (and a simple notion of fractions) is studied in combination with addition; subtraction is next developed,

and finally multiplication is introduced. It is to be remembered that these are not exact and concrete processes at first, including a clearly defined *how much* concept, but are more or less indefinite and vague. It is only by degrees that they assume definite meaning, as the process of *measuring quantities* is added to that of *numbering units*. Emphasis must therefore be laid upon the *general* nature of these early number concepts.

Number is a relation. It deals with the whole, as composed of parts and of parts as composing the whole. It is an abstract mental process and not a sense-percept. In teaching number it is therefore necessary to abstract as far as possible from the objects studied those qualities which attract attention to sensory phenomena. The objects used in this course are colored cubes, so constructed that the colors may be used singly or in combination. The method follows the suggestion of McLellan and Dewey regarding the use of cubes, and is in some respects similar to the methods of Froebel (3d Gift) and Grube.

It may be objected that the introduction of fractions at the outset makes the work too difficult, but this is not the case. The taking apart and recombining of a *whole* is one of the first instinctive acts of the normal child, and is performed long before counting is understood or attempted. The subnormal child cannot exhibit this tendency with the same fullness and varied application in the early period of development, and the *part-whole* concept must therefore be awakened by more systematic and concrete means.

KINDERGARTEN.

The work of this class begins with the study of a *whole* and its *parts*. The apparatus required consists of 16 blocks (3 inches square) and a thin flat piece of wood (18 x 1 x $\frac{1}{4}$ inches) sharpened along the edge like a knife. Each side of these blocks is colored with one of the standard colors as follows: white, black, red, green, blue, yellow. In applying these colors two points are to be remembered. First, that when all the similarly colored sides are uppermost, the field will be an unbroken plain color. Second, that the colors are to be arranged so that the following pairs fall upon adjacent sides: black and white; red and green; blue and yellow.

In beginning the work, the 16 blocks are to be placed before the pupil upon the black felt square in four rows of four each, with sides of the same color uppermost. There will thus be formed a 12-inch square, presenting a uniformly colored surface. The pupil should not be permitted to see this square built. The idea of a *unit*, of *one* square, should be preserved. For this reason the blocks should fit together closely and the interstices should be as far as possible invisible.

The teacher will say: "This is a quadrangle." (The term quadrangle is selected because it is entirely new to the pupil and brings with it no confusing associations. The child will learn a "long" word or an unusual one as readily as an easy word if it is properly associated with its object or action). She should then move her hands over the surface of the quadrangle and about its margin, saying: "This is *one* quadrangle." She should next grasp the child's hands and

move them in a similar manner, repeating the same sentence. The teacher may also say: "This is a *whole* quadrangle."

This exercise is to be repeated until the child can say "one" and "whole," or indicate in some other way that the meaning of the exercise is grasped.

The wooden blade is then introduced into the central vertical interstice between the blocks and the single group separated into two groups of eight blocks each. The intervening space should be about 3 inches. The teacher says: "I *divide* the quadrangle into halves. There are *two* halves. *One, two.*" The teacher counts and points with the finger, first to the left group, then the right one and *vice versa*. "*One whole* quadrangle makes *two half* quadrangles." The child is then to repeat the exercises, the teacher grasping his hands and saying: "John *divides* the quadrangle." "There are *two halves*," etc. The two halves should be actually touched by the pupil as before. The pupil's hand should be placed upon one half, the teacher saying: "one"; the other hand should then be placed upon the second half, "two." Both hands should touch the halves *at the same time* while "two" is spoken, so that the child will realize that *two* is a group and not simply one and another one.

When this drill has been thoroughly taught, the accompanying *synthetic* process may be introduced. The teacher should reverse the former method, moving the smaller group of blocks back to its original position, and saying: "I join the two halves. Two halves make one whole." It may then be explained that when one quadrangle is divided, each half becomes a new but distinct smaller quadrangle. "One and one are two." One of these smaller quadrangles should then

be divided laterally into square halves composed of four blocks each, the teacher showing that two may also be produced in this way. The second quadrangle is next to be similarly divided. When this is understood the teacher should join all the segments and re-divide, first into two halves, then by means of a second bisection, into four quarters, saying: "I divide the quadrangle into two halves; I divide each half into two *quarters*. *Two* quarters and *two* quarters are *four* quarters." Placing the child's hands first on one pair of quarters, then on the other, she may say: "*Two* and *two* are *four*." It is to be noted that the number four is taught before three. This is because the subdivision into 2 and multiples of 2 is the simplest possible. The concept of doubling or making a pair is more readily grasped than that of tripling or forming a trine. The number three may be taught, however, after the easier numbers have been learned. The teacher may then point to or touch each quarter and count: "one, two, three, four quarters make one whole."

These exercises are to be repeated until they are understood by the pupil, even if several months are required to accomplish this. It is important to have the pupil do the dividing, recombining and counting himself. At first his hands will have to be moved by the teacher. Perhaps it will be necessary to repeat this several hundred times before a voluntary attempt will be made to go through the exercise without help. A new exercise should never be undertaken until the previous one is actually and thoroughly understood.

When the exercises up to four are familiar, other colors should be introduced. Thus the red quadrangle may be divided into two halves, one of which may be made green

by a quick turn of the rows of blocks by the teacher. The halves may be again divided, and one quarter made black, another white, thus giving four colors. These exercises should be varied by the teacher so as to hold the pupil's attention and interest as fully as possible.

PRIMARY II.

After reviewing the earlier work a new division into quarters may be introduced, demonstrating that *four* can be produced in more than one way. The 16-block square should first be bisected vertically. The halves should then be divided in their longitudinal diameter, forming four quarters, each composed of a single row of four blocks. All these divisions of the square may also be made laterally for the sake of variation. The colors are to be used, and drill given in the rapid naming of the block number-groups. A beginning may also be made in the recognition of number-groups from one to four in connection with other objects. Care should be taken that these objects are at first all alike. A group of smaller cubes is most suitable for the first training in this exercise.

Correlative with the block exercises the teacher should draw on paper a large single square and write after it the figure I; next two quadrangles may be drawn accompanied by the figure II. Then four small squares with the figure IIII. Finally two squares with one below them and the figure III. The pupil should be required to repeat these drawings, the teacher guiding the hand at first, and to write the figures: I, II, III, IIII. Numerals may also be traced over a large heavy-faced copy, by means of the trans-

parent slate. In addition the pupil should write the numerals upon paper, joining dots previously made by the teacher

PRIMARY I.

A thorough review should be given, and the study of the number-blocks then continued. In this class the number-group *five* should be introduced. For this purpose another row of four blocks is added to the 16-block square, thus making a quadrangle of five rows with four blocks in each row. The division and recombination into parts should be carried out, one quadrangle being broken up into 5, 6, 7, 8, 9, 10, 11 and 12 parts. Two other colors may thus be utilized.

The pupil should be taught to count readily from one to ten. The number-groups five and ten should be studied with particular attention. Objects other than the blocks may be made use of in this connection, the pupil being encouraged to associate objects in a group by counting them.

The concept of *many* should be made clear. For this purpose the twenty-block quadrangle may be used. One block should be separated from the others. This is "one." The other blocks are then to be scattered before the child so that they present a number of isolated units, and this is called "many." Other groups of objects may be used, such as large wooden beads, leaves, pebbles, apples, lumps of sugar, etc.

The tracing and dot-to-dot notation with vertical strokes are to be continued, adding the numbers four to ten. The Roman form of the numerals from IV to X is also to be taught, as a foundation for time-telling.

The Arabic numerals should finally be introduced, using the dot method, and employing drawings of the blocks as graphic representations of the number written. The peg-boards with colored pegs may also be utilized, particularly board No. 3.

Simple addition and subtraction should be commenced and a beginning made in United States money, the cent, nickel and dime being taught. These coins may be used in connection with objects of various sorts, such as apples, oranges, pencils, for instruction in the elements of buying and selling.

INTERMEDIATE II.

The class should have a review of earlier work. The block-system is then to be continued, amplifying the combinations of number-groups. The 10-group and its multiples are to be studied, the pupil being taught to count to 100, and to write the corresponding numerals.

Simple multiplication, embodying the idea of *times*, is to be commenced, accompanied by the first two multiplication tables. These should be learned as *songs*, using the music specially prepared for this purpose. A beginning should also be made in the concept of *proportion* and *equality*, using the phrases *as many as* (later also *as much as*) and *equal to*, or *equals*.

The 12-group is then to be developed. Its relation to the pair, and the trio may be brought out. It may be compared with the 10-group, and the difference between odd and even numbers demonstrated with the blocks and by means of the systems of notation.

In connection with the 12-group the Roman numerals XI and XII should be taught preparatory to time-telling.

A beginning is next to be made in the development of the concept of *how much* or of measurement. Linear measurement should be taken up first. The difference between *long* and *short* may be shown by means of blocks placed in a row. The 4-group is then to be selected as a basis for developing the inch and foot. Four blocks should be placed in a row, and a paper or cardboard *ruler* made by the pupil as long as the row of blocks. (It should be 1 x 12 inches). This is *one foot* long. The ruler is then folded in the center, cut and each half again bisected. Each segment of the ruler will thus be as long as one block (3 inches). Another paper ruler is then to be made by marking off four times the length of the 3-inch segment with a pencil. A ruler is thus formed, which is divided into half and quarter feet. One of the quarter-foot segments of the first ruler may finally be divided into three parts, each of which is *one inch*. The foot is thus made up of 12 inches. This foot rule may be made in clay and in wood and should be utilized in measuring various sorts of linear distances.

The *how much* concept should be further developed by teaching the *pint* and *quart* dry measure. A quantity of dried beans, rice or other material should be used. The pupil is to be taught first to measure these by finding out *how many times* a cup may be filled by an indefinite quantity poured out by the teacher. A pint cup and a quart cup are then to be used, and the pupil taught that these contain definite quantities which never vary, and that any amount of beans may be measured and stated in terms of pints and quarts.

In United States money the quarter-dollar, half-dollar and dollar may be taught and buying and selling continued, introducing the making of change.

A beginning should be made in time-telling, using the clock-face with movable hands and Roman numerals.

INTERMEDIATE I.

Review. The block system is to be used in this class for review only and for drill in elementary number, attention being paid to speed and accuracy in counting. The pupil should be taught to count to 1,000 and to count in tens and hundreds. The multiplication tables should be taught as far as the sixth. The fourth primary number operation, *division* is to be introduced, and correlated with the objective work. Simple fractions may be explained also.

The study of the foot-rule is to be continued. The yard should be brought in, and a very thorough drill in the relation of inch, foot and yard given. Practical application of the rule is to be made in measuring sizes and distances accurately and in drawing to measure.

The measure of surfaces is then to be undertaken. With the foot-rule as a basis, the square inch, square foot and square yard may be worked out. This should be correlated with the surface of the number-block quadrangles, which may be measured, and additions, subtractions, etc., of definite surface-quantities made. The paper-folding and cutting of the 16-square paper should also be correlated and a beginning made in drawing, folding and cutting objects to measure.

In dry measure the *peck* is to be introduced. The pint and

quart in liquid measure should also be studied, and the *ounce* and *pound* explained.

In United States money change-making is to be continued. Time-telling is also to be further amplified, the relation of time to space and to motion in space being brought out.

The meaning of single, double, treble, quadruple, should be thoroughly taught by means of the block-system. The meaning of *few* may be added, contrasting it with the *many* previously learned, and pointing out the distinction between *indefinite number* (few or many) and *definite number* (3 or 500). As a training in the rapid recognition of number the pupil should be drilled in finding hymns quickly by number, in turning promptly to a page in a book, the number being stated by the teacher, and in reading rapidly numbers written on the blackboard without regard to numerical sequence.

ADVANCED.

Review. Frequent drills in counting, reading numbers, and in speed and accuracy in the primary operations should be given. Fractions are to be continued and long division introduced. Simple ratio may also be taught. The multiplication tables as far as the twelfth must be taught so that they may be recited or sung without hesitancy.

The measure of solids is to be taken up by this class, using the foot-rule, as a basis for the elaboration of the working out the cubic inch, foot, etc.

The study of avoirdupois weight and of dry and liquid measure is to be completed and the tables learned.

All denominations of United States money and all combi-

nations of change must be made perfectly familiar. Pounds, shillings and pence are also to be taught.

The practical application of number-work to daily life and especially to commercial and business life, is to be developed. The pupil should learn how to keep simple accounts, how to make out and receipt bills, and how to draw, endorse, deposit and cash checks. Banking, loans and interest should be taught in elementary form, and the relation of notes, drafts, checks, etc., to actual cash explained.

V. HISTORY AND GEOGRAPHY.

These subjects are best taught together. The difficulty which subnormal children find in grasping abstract concepts makes it necessary to teach first the geography and history of the home, beginning in a very general way with the house and grounds, then taking up the home city and its surroundings. This may be followed by a journey to a nearby city and a subsequent study of it. The State may be taken up next, then other States, then the United States, and finally foreign countries.

The topography, minerals, flora, fauna and climatic conditions of each country are to be taken up. The conditions and history of the present time must be studied first. Past history may then be introduced, avoiding rigid adherence to chronological order, and developing particularly the biographic phases of the subject. The manners and customs of the people may be touched upon, and something said about the development of religion, literature, industry, commerce and government.

The first three classes do not study this subject.

INTERMEDIATE II.

The class is to be taught about *The Lindens*, learning about the house, the hill, creek, woods, trees, flowers, birds and animals. The town of Haddonfield may then be taken up. The surrounding country is to be studied, its soil and trees, birds, etc., the outlying farms and their produce, its industries and the railroad that passes through it. Stories about the settlement of the town, about the Indians, and about some Revolutionary incidents should be told to the class. Something about the flat, sandy nature of New Jersey may be taught, bringing out the scarcity of rocks and hills. The class may also be taught about the Delaware River and the Atlantic Ocean.

INTERMEDIATE I.

Review. A more detailed study of the state of New Jersey is to be undertaken by this class. A brief survey of the commerce of the Delaware River and of the industries and history of the city of Philadelphia should then be given. A similar study may be made of the states of New York and Maine and of the cities of New York, Boston and Rockland. A general outline of the physiography of these states and a simple statement of their mineral resources and development, flora, fauna, climate and industries should be made. The cities may then be taken up, touching upon their commerce, industries and manufactures. The history of the cities and states may be woven in, attending particularly to colonial and revolutionary times. Simple instruction should

be given also regarding the systems of state and municipal government. The pupil should learn the names of the governors and mayors, and in general what their duties are. He should know something about law and the preservation of order by police. The difference between a village, a town and a city should be brought out, and thorough drill given in the following words: bay, ocean, sea, island. The points of the compass and the use of that instrument should also be well taught.

ADVANCED.

Review. This class should take up a general study of the states and the United States, including a brief survey of the history of the Indians, and of colonial, revolutionary and modern times. The industrial development of the nation should be traced, and a simple outline of the national government presented.

The continent of North America should then be taken up. This may be followed by a very brief study of the other continents and finally of the globe. Maps should be used here with great caution. The first map to be used should be the globe. This may be followed by topographic maps of states or countries, but care should be taken not to introduce false ideas of the outline and relationship of the territory studied. Small maps of New Jersey, Maine and North America may be modeled in clay. The climate, flora, fauna, etc., of foreign countries should be touched upon only very briefly. The studies may be amplified and interest in them intensified by postal-card picture-study and by sense-tests of native products.

General history should be limited to brief stories of places and persons, chiefly European. A little ancient Greek and Roman history may be included. Frequent drill upon the following words and their significance is to be given: county, state, republic, continent, kingdom, empire, mountain, valley, canal, railroad, telegraph, telephone, cable, post-office, court-house, custom-house, lumbering, mining, agriculture, stock-raising, markets, manufactures.

VI. LITERATURE.

The scope of this course is necessarily limited. The aim should be to familiarize the pupil with the beginnings of language, and to acquaint him with some of the masterpieces of literature, ancient and modern, rather than to undertake a systematic study of the subject. The value of good literature in improving the pupil's style and in developing his critical literary judgment should be remembered, and exercises planned with these ends in view.

The first four classes are not given this work.

INTERMEDIATE I.

The work should commence with a simple exposition of the beginnings of language. It should be shown that thought or feeling finds expression in some outward way. This may be unconscious, as facial expression often is, or conscious, as is seen in voluntary signs and words. A sign of the hand or arm may carry with it a whole train of thought. We may point to the door when we wish to go out, or to food upon the table, to a chair, and then to our mouths to signify that

we are hungry and wish to sit down and eat. We may use the voice also to express our feelings and thoughts. In the evolution of language feeling was the first to be so expressed. This is shown by the baby, who laughs or cries as his emotions prompt. When a little older he points to an object and says: "Ah!" or "Uh!" which means "I want that." Thus in the babyhood of the race words were evolved to express the hidden processes of the mind. At first these were only spoken words, but later pictures were used to preserve the thoughts. These pictures became more and more simple as their use extended, a few lines sufficing to represent a complex idea. In time the pictures became mere signs, the meaning of which was learned by everyone. At length the signs instead of representing thoughts came to represent *sounds*, and hence combinations of signs when interpreted resulted in a reproduction of spoken words. This is the way the alphabet developed. At first each nation had its own alphabet, but one nation began to borrow sound-signs or *letters* from another, until now many nations—although not all—use the same letters.

The materials used for writing may be briefly described. Pictures, signs and letters were first cut in stone; later tablets of wax were used, next rolls of papyrus (from which we have the word paper), then parchment scrolls and books, and finally paper. The wonderful manuscripts of early times may be described, and the invention and developing of printing introduced.

The *Bible* is to be selected as the first example of ancient literature. The story of its origin may be briefly told, and the Hebrew and Greek texts described and shown. The

translation of one language into another should then be fully explained, and the origin of our present English text pointed out. The pupil should be taught to name the books of the Pentateuch and the four Apostles and the Revelations.

As a second example of early literature, the *Iliad* and the *Odyssey* should be selected. The story of their origin and authorship should be told, and tales from them selected and read to the class. The origin of Mother Goose and her rhymes and stories is also to be given.

Once a month the pupil should be required to write a composition upon some subject taken up in this class. The pupil should make an individual literature-book in the manual-room, decorating it with appropriate designs and illustrating it with pictures. This book should be used as a copy-book for notes and compositions.

ADVANCED.

Review. This class should be taught about Socrates, Plato and Aristotle and about their works. In a very brief way the teacher should outline the beginnings of science and philosophy, and contrast them with modern development.

The evolution of modern languages should be traced, their relation to Oriental languages pointed out and the Latin and Germanic tongues compared. The pupil should know the names of the following ancient and modern languages: Hebrew, Greek, Latin, Arabic, Hindi, Chinese, Japanese, Russian, Polish, Norwegian, Swedish, Danish, German, Dutch, Italian, Spanish, Portuguese, French, English.

In modern literature the class should read, discuss and write in paraphrase selections from the following authors:

Spenser	Emerson
Chaucer	Longfellow
Milton	Alcott
Shakespeare	Hawthorne
Bunyan	Robert Browning
Tennyson	J. C. Harris
Wordsworth	T. B. Aldrich
Lewis Carroll	Eugene Field

VII. NATURAL SCIENCE.

The natural sciences included in this section are those which cannot be taught by the ordinary observation and examination of objects as they appear in nature, and in which laboratory exercises of more or less technical nature are required in place of informal rambles in the field. It is particularly difficult to present these sciences in intelligible form to subnormal children; in fact, many branches are quite beyond their grasp.

Four subjects may be taught, however, so that some of the fundamental facts will be understood. They are physics, astronomy, chemistry and physiology. The latter should embrace both plant and animal forms, including the human, and should be accompanied by some instruction in elementary morphology.

No attempt at a systematic treatment of the subjects should be thought of. All that is necessary is a simple

presentation of a few facts and theories, combined with easy experiments and correlated with common life.

The work begins in the fifth class.

INTERMEDIATE I.

Physics. A few fundamental properties of matter may be brought out here, using the tactile sense-tests as a basis. It may be first explained that *matter* is anything which occupies space, or "takes up room." This may be illustrated by placing objects, such as blocks, in a box. They fill the space in the box; therefore they are *matter*. Many kinds of objects may be used, hence all kinds of substances are matter. The use of a general term which includes many kinds of things in a single group should be explained, giving examples such as the different letters of the alphabet, no two of which are alike, yet which, taken all together, make a specific group. Words also differ greatly, but they are all words, nevertheless. So, substances or pieces of matter differ greatly, but may all be included under one head, *matter*. The pupil may be encouraged to think of examples illustrating this. A *mass* may be defined as a piece or lump of any kind of matter, whether large or small. The amount or quantity of matter in a body is its *mass*. The relation of mass to weight may be pointed out here. It may be shown by using a pair of simple balances and a lump of plasticon or moist clay, that the greater the *mass* of a body, the greater its weight. Hardness or *impenetrability* should be demonstrated by comparing a lump of wet clay with one that has dried. A simple experiment illustrating this is afforded by the solidification of plaster-of-paris. At this

point *density* may be introduced. Some things are *harder* or *denser* than others. Iron is denser than wood (hence it will cut and indent the latter). The denser a body is the heavier it is. The relation may now be brought out between mass and *volume*. It may be shown (using a piece of iron and one of wood of the same size and shape), that although the volume or space occupied is the same, the density, and hence the weight, varies. There is thus more matter in the iron than in the wood, and consequently the mass of the former is greater. To illustrate this further, absorbent cotton may be used. It may first be shown that the density of this substance is not great. It is easily penetrable and is light in weight. The teacher should then take two masses of decidedly unequal size and roll them each into little bundles of equal volume, tying them thus with cord. The larger mass is of the same volume as the smaller, but its weight is decidedly greater, and its density has been increased by compression. *Elasticity* may be touched upon here.

A study of the solid, liquid and gaseous states of matter should also be undertaken with this class. A lump of ice may be melted and the water used to run a little toy steam-engine, thus illustrating how heat brings about these changes. The visible particles of steam may be pointed out as illustrating that water and ice are made of many little particles so small that they cannot be seen. It should then be explained that all matter is similarly composed. Reference may be made to the powdered plaster-of-paris, out of which a solid object like a stone was molded. The clay may also be shown to be similarly constituted. This

of course is a very imperfect presentation of the theory of atoms and molecules, but it will serve the present purpose. An alcohol lamp and a small evaporating dish may then be utilized to show how many substances melt or liquify when heated and solidify when cooled. (Butter, wax, paraffin). The relation of the heat may be explained by describing the *motion* set up in the little particles by heat. This motion becomes so marked that the particles of solid substance begin to move apart, to liquify, to boil, and *expansion* results. This may be illustrated by filling a test tube with water, corking tightly and heating. The cork will be expelled. The expansion may be actually seen by inserting a perforated cork with a 6-inch glass tube attached. The water will be seen rising in the tube. Further expansion or "motion apart" may be shown by the particles of vapor (of water or grease) which detach themselves and fly upward as the temperature rises. The principle of the steam-engine should be explained on the basis of heat-expansion.

A few simple experiments should be performed with light. The relation of heat and light should be pointed out and the origin of both in the motion of invisible particles explained. A convex lens may then be introduced and the heat produced by focusing the sun's rays demonstrated. It may then be shown that a beam of light travels in a straight line. The reflection of light should next be illustrated with a small mirror. The underlying principle may be made clear by bouncing a ball, and then by showing how even motion may be reflected, using the ripples or waves of water in a pan as an example.

Chemistry and *astronomy* are to be omitted from this

class. A beginning should be made in *physiology* by teaching that food nourishes, giving strength or energy, and building new tissue. The action of a muscle may then be explained and illustrated, and the general mechanism of voluntary motion described, drawing some practical lessons regarding exercise, gait, posture, fatigue and rest.

ADVANCED.

Physics. After a thorough review of the earlier work, the subject of *motion* should be introduced, following lines similar to those laid down in treating of matter. Various kinds of motion should be illustrated, and the general concept of *force* developed. *Gravity* may first be taken up, followed by a study of potential and kinetic energy, using a metal spring as an illustration. *Cohesion* and *adhesion* should then be studied, and finally *magnetism*. A very simple statement may also be made regarding *electricity*, demonstrating by means of a small battery, and by friction of a piece of hard rubber. The existence and use of all these forces in nature should be dwelt upon. The all-pervading presence of the invisible ether should be clearly stated, and the relation to it of the phenomena of heat, light and electricity explained in a simple way.

It must be remembered, however, that these facts and theories are to be stated in the simplest possible form, absolutely devoid of confusing phraseology. The teaching should be confined almost entirely to the most elementary statements of fact and descriptions of phenomena.

In the study of light, *refraction* is to be taken up. The experiment with the burning-glass may be recalled, and the

subject developed so that the action of lenses in eyeglasses, and in optical instruments such as the microscope, opera-glasses, stereopticon, etc., may be understood in a general way. The prism should then be studied and the refractive separation of the spectral colors shown. It may then be demonstrated that the transmission of white light through colored media *absorbs* or takes away all but one of the spectral colors. This experiment should be used as a basis for the explanation of the color of objects, all the colors being absorbed except one, which is reflected and thus strikes the eye. Colors in nature, including those of the rainbow, the sunset, etc., are to be correlated.

Astronomy. This subject is to be taken up in a very simple and non-technical way, presenting a general conception only of the various phenomena. The earth should first be described, using the globe for illustrative purposes. The geography and history lessons are to be correlated here. The sun should next be studied and the earth's motions and solar relations demonstrated and explained, bringing out the connection of the phenomena with what has been learned about gravity, etc., in physics. The part played by these motions in the measurement of time, and in the production of day, night, and the seasons should also be explained. The cause of differences in climate should be made plain. The moon and its motions and phases should next be studied, including its relation to the tides and to the lunar months. Finally the planets and fixed stars may be touched upon and if possible three or four easy constellations learned by observation, such as the great and small dippers (pole star), Orion, Cassiopeia's chair.

Chemistry. In this subject the aim should be to develop a general understanding of *elements* and *compounds* and of the formation of all common substances from the former. In order to illustrate the fact that substances may be readily changed into other substances by decomposition and synthesis the following experiments may be performed by the teacher. (Great caution must be exercised in using all reagents). A solution of iron in sulphuric acid will form a greenish solution of iron sulphate, and hydrogen gas will be given off. The salt may be crystallized from the solution in greenish prisms by evaporation. This illustrates that iron may be changed into something that is not iron. Metallic silver may be produced by adding a solution of chloral hydrate to a diluted solution of ammonio-silver nitrate in a test-tube and warming gently. The silver will be deposited as a mirror on the tube. This illustrates that silver may be recovered from something that is not silver. The fact that substances may be present in solution and yet be quite invisible may be proved by adding a little solution of potassium iodide to some mercuric chloride solution. Both solutions are colorless, but a heavy salmon-pink precipitate results from their admixture. Ordinary limestone or chalk may be dissolved in hydrochloric acid with the evolution of carbon dioxide gas. The calcium carbonate may be recovered as a white precipitate by adding sodium carbonate solution to saturation. The oxidation of a metal may be illustrated by rusting iron and by burning magnesium ribbon. In the latter case a white oxide remains.

With these and other experiments as a basis, it should be made clear that there are a limited number of elementary

substances in the world and that all other substances result from various combinations of these. They are *compounds*. The former are *elements*. (Compare here the familiar illustration of letters, words, sentences, etc.)

The atmosphere should then be studied and the properties of oxygen described. The universality of oxidation should be pointed out, and its relation to combustion and respiration emphasized.

Physiology. Review. A simple outline of digestion should be given to this class. The requirement of food by the body, and the reasons for care in its selection, preparation, and time and manner of eating (mastication, hasty swallowing, etc.) should be presented. The digestion and absorption of foods in the stomach and intestines should be explained together with a brief description of the structure of the digestive organs. The circulatory apparatus should then be described and the circulation explained in a simple manner, tracing the course of the blood from the heart to the tissues and back again in the performance of its functions of a bearer of nutriment and waste. The action of the heart-muscle may be illustrated in a simple way by using a rubber bulb filled with water. The pupil should be taught to recognize the heart-beat and the radial pulse. Respiration may also be discussed and the necessity of oxygen pointed out. (For plant and animal morphology see *Nature-Study*.)

VIII. NATURE-STUDY.

In nature-study the aim should be to awaken in the child a love for the things of wood and field, not only living crea-

tures and growing plants, but also the dead stones and the earth itself. Familiarity with animal, vegetable and mineral forms, and acquaintance with their life-histories, while important, should be made secondary to this prime requirement. The teaching should include in a general way the subjects of zoölogy, botany, mineralogy and geology. These must of necessity be presented simply and without technicality. As much as possible the work should be done abroad in the fields. The class should study animals and plants in their natural habitat. Specimens should be brought home and studied later in the class room. The facts learned are to be made interesting and imbued with meaning by stories, songs and talks by the teacher, and by sketches, drawings and compositions by the pupil. The child is to be trained in gentleness and love for animals, and should be given every opportunity to liberate and aid helpless creatures, rather than to capture and destroy them.

KINDERGARTEN.

Work in this class should be confined to walks in the open air with the teacher, during which flowers and leaves are gathered and described in a very brief way, attention being paid particularly to recognition of color, using the colors white, red and green. The pupil must not be permitted to gather specimens aimlessly or to tear or injure them. In the school-room time may be devoted to pictures of leaves and flowers, selecting simple ones only. The pupil may be permitted to trace a leaf on the transparent slate, the teacher at first guiding the hand.

PRIMARY II.

The work in this class is essentially the same as that of the kindergarten. The colors blue and yellow may be added to the list of those used previously, and the pupil may be taught to recognize bees, flies and grasshoppers in addition to the observation of flowers and leaves.

PRIMARY I.

Brief review. A detailed study of the maple leaf should be taken up. The pupil may draw the leaf both by tracing and by the dot method, and may color it when a good drawing has been produced. A beginning may be made in the study of *growth*. The child should be taught that the seed comes from the flower. Various seeds may be shown, such as corn, beans, peas and grass seed. Some of these may be planted by the child in a window-box and germination and subsequent growth watched. The development of plants from seeds should be explained, and the sprouting of seeds in the spring, the farmers' planting, etc., described.

The following fruits and vegetables should be well taught during the year: apple, orange, pear, peach, grape, tomato, potato, carrot, onion, celery. The following sounds of animals should be made familiar: dog, cat, horse, cow, rooster, hen.

INTERMEDIATE II.

Review. The maple is to be studied in more detail. Various forms of maple leaves should be gathered and compared. The life-history of the maple tree should be told and something taught about the sugar maple and the collection

of its sap. The concept of growth in the vegetable kingdom should be amplified. The various stages of seed, sprout, plant, bud, flower, should be traced through their sequence, and a simple explanation given of the changes in annual and perennial plants which appear in spring and autumn.

In connection with the subject of growth a comparison of young and old may be made. A brief history of the chick should be given. The dog and cat should also be studied, the puppy and kitten being compared with mature animals. The frog and the fish may also be taken up. Little stories about all of these animals should be told, illustrating the differences in their development, habits, food and habitat.

The pupil should learn to recognize the sounds produced by the following: cricket, katydid, robin, canary, woodpecker, pigeon, sheep.

INTERMEDIATE I.

Review, adapting the material to suit more advanced pupils. The study of growth should be continued. The growth of the human species may be taken up, showing how the infant develops into the child, then the adult and finally the aged.

The class should take several trips to the zoölogical gardens for the purpose of learning to recognize the common forms of wild animals and birds. The young of domestic and wild animals may also be studied. A detailed study of the changes which occur in plants during the seasons and the reasons for them should be taken up. The effect of temperature upon plant life and the differences in the flora and fauna of tropical, temperate and arctic regions may also be touched upon.

The life-history of the honey-bee should be thoroughly studied. This work is to be taken up in the spring, a hive of bees being kept in the garden to be cared for and observed by the class. The pupil should be taught how bees live in colonies, building their combs of wax and storing in them the honey and pollen gathered from the flowers. The queen-bee should be pointed out, noting her large size, the eggs that she lays in the lower combs, and the way in which these eggs develop in larvæ, chrysales and mature bees. The economic division of labor in the hive should be explained, noting the expulsion of the drones from the hive "because they do no work," and contrasting with them the busy workers who fly away to flowers, gather honey and pollen, returning heavily laden and depositing their burden in the hive. The pupil should observe how some workers build the comb; others attend the queen and care for the eggs she lays; still others guard the doorway of the hive to prevent the entrance of enemies or strange bees, attacking any such who approach and using their weapons of defence, their stings; others again who stand inside and outside the entrance, fanning their wings rapidly to ventilate and remove dust from the hive. This study may be made a source of great pleasure to the class, and may serve to bring out many excellent moral lessons.

Common trees, such as the oak, chestnut, elm, spruce, pine, birch, etc., and common wild-flowers, such as the anemone, mayapple, blood-root, Jack-in-the-pulpit, daisy, buttercup, cowslip, milkweed, tansey and wild carrot should be taught. Those common cultivated flowers not already known to the class should also be made familiar. Drill

should be given in recognition of the sounds of the cicada, the tree-frog, the goose, duck, crow, guinea-hen, turkey, pig, goat.

ADVANCED.

This class should have a thorough review of the earlier work. After completing the general review of growth, the subject may be taken up in greater detail. In addition to the germination of vegetable seed, the structure of plants in general and of a few common species in particular is to be taken up. This should lead to a brief outline of the classification of the plant-kingdom. In the animal-kingdom a similar method should be followed. The origin of insects and other lower forms from the egg, and their stages of development, should be followed by an elementary classification of all animal forms.

In company with the previous class, this class should study the honey-bee. Other forms of hymenoptera may be correlated, and a study of the life-history of the silk-worm should be added.

The class should learn something about the common forms of rock. The common precious stones should also be taught, and the class should be able to recognize five or six familiar species. The formation of the soil and the deposit of soils and muds by water are to be studied. Later a brief description of the earth should be given, explaining how extinct forms of life have been discovered.

IX. PICTURE-STUDY.

The study of pictures should have a three-fold purpose: first to train the pupil in the observation and memory of

form and color, particularly in the beauty and harmony of these; second to teach the pupil about places and things which could not otherwise be brought before him in objective form; third to develop the pupil's appreciation of the best in art and to familiarize him with some of the most famous pictures. The work should be carefully correlated with the memory-training and with studies in language. The pictures to be employed should be the black and white photo-engravings of the Perry pictures or some similar series. Pictures of fruit, birds, etc., should be colored. The stereopticon and the cinematograph may be introduced in this work with great benefit.

KINDERGARTEN.

Training in the elementary perception of form and in the observation of detail in form and color should constitute the basis of the work in this class. Three pairs of charts are to be used. The first picture of each pair is to be a simple but distinct picture of an object giving all the necessary detail of form and color, the second is to be merely a figure similar in outline and color to its corresponding object-picture, but without any detail to give it specific character. The three pairs should be: (1) a red apple; (2) an orange; (3) a doll with a green dress. The pupil should be shown first the colored picture, then its corresponding object-picture, the name of the object being spoken by the teacher. The two are then to be placed side by side and the child required to select the picture of the object when the teacher names it. Only one pair of charts should be used at a time, and another never should be taken up until the first pair is familiar.

The pupil should also be taught to put together split pictures. These should consist in this class of two forms: (1) a red square (12 x 12 inches) of cardboard cut into two-inch oblong strips; (2) a green disc (12 inches in diameter) cut into eight equal segments. The pupil is to be taught to place these objects together as they belong. No picture should be used at first, merely the plain color.

PRIMARY II.

This class should review the earlier work. The following may be added: two pairs of charts (4) a dog and (5) a horse; three split pictures, (3) a blue square (12 x 12 inches) divided diagonally into eight parts; (4) a yellow disc, separated into six strips by divisions parallel to the diameter; (5) a white square (8 x 8 inches with 1-inch oblong strips), on which is a picture of a red apple.

Four pictures of animals should be studied (dog, cat, horse, cow).

PRIMARY I.

Review. This class should learn during the year to recognize eight pictures of common objects painted by famous artists. Pictures of animals, the schoolhouse, the church, etc., may be selected and a little story told about each one.

More complex split-picture work should be taught, using simple pictures of familiar objects.

INTERMEDIATE II.

The class may review the earlier work at the discretion of the teacher. Ten famous pictures should be taught during

the year. These should embrace three animals, 1 marine scene, 1 landscape, 2 portraits, 3 familiar madonnas. An interesting story should be told about each picture, and the pupil taught to recognize the picture at sight, describe it, and write a short composition upon it. In connection with this work selections from *Cyr's Graded Art Reader*, Book I, may be used.

Colored pictures of flowers, fruit, vegetables, birds and animals may be utilized but the selection of these must be carefully made, and not too many given, as confusion in the mind of the pupil may otherwise result.

Complex split-pictures and sawed picture-puzzles may be given in this class, either for busy-work or as an employment out of school hours.

INTERMEDIATE I.

A review of the work of the previous class should be given. The class should take up a series of ten famous pictures illustrative of scenes upon the farm and in the barnyard. These pictures should be correlated and a story woven so as to include the whole group. Selections from *Cyr's Art Reader*, Book II, may be introduced.

Colored pictures of flowers, birds, etc. and various picture-puzzles may also be employed.

This class, in conjunction with the Advanced class, should study the series of 12 colored pictures, illustrative of the *Arabian Nights Entertainments*, by Maxfield Parrish (P. F. Collier & Son). These pictures are particularly fine examples of form and color harmony, and are to be carefully studied. In connection with them a child's edition of the

Arabian Nights is to be used, the class being made familiar with the stories illustrated.

ADVANCED.

This class should review the earlier work. The barn-yard series is to be learned, and the color pictures used. *Cyr's Art Reader*, Book III, should be studied by this class.

The *Arabian Nights* series of pictures is to be used, greater attention being paid to color-study, and to the correlation of the stories with the pictures.

MUSIC

No branch of the training of subnormal children is of more importance than music. Many of these children are appealed to better and more quickly by stimulating the auditory sense than by any other means. The rhythm of the music lays strong hold upon their interest. Not infrequently it is at first the only stimulus which will fixate attention more than momentarily.

Both vocal and instrumental music should be employed. In addition to the training which these give to the auditory sense and through it to other functions and faculties, the former develops the voice and the vocal organs, the latter brings out valuable correlations and coördinations of the special senses with voluntary movements. The recognition and appreciation of good music also forms an important part of the training.

Music should be introduced into the work wherever it

can be made of value. It should form part of the work in physical culture, kindergarten and other plays, memory and sense-training, choral exercises, etc. In addition to these the subject should be taught systematically. It must not be forgotten that music has definite therapeutic effects, and that its sedative and relaxing action may often be put to good use.

KINDERGARTEN

The chief work in this class should consist of motion-songs. The march should be used to obtain rhythmic motion of the whole body. In addition to this three appropriate motion-songs should be selected for the head and upper extremities, and three for the trunk and lower extremities. The finger-plays are also to be introduced. All of these songs should be sung by the teacher while an assistant moves the child's extremities through the proper evolutions. This must be continued until the child can repeat the exercise without help.

The class should be sung to frequently. Nursery rhymes, Mother Goose songs, lullabies, etc. are to be used, and an attempt made to teach two simple word-songs.

Each pupil should also be given very simple finger-exercises upon the piano, and should have frequent drill upon some easy wind-instrument, such as a flageolet, in which the blowing is associated with simple fingering.

PRIMARY II.

The work of the kindergarten class is to be reviewed and amplified. The motion-songs may be increased in number

and complexity, and greater proficiency required in the word-songs.

A beginning should be made in singing. A single note is to be sung first, the teacher insisting upon well-sustained tone. A higher note is then to be taken, so on until a simple scale can be sung.

In instrumental music a simple scale should be taught upon the piano and also upon the flageolet or concertina.

PRIMARY I.

Review. The drill in motion-songs and game-songs is to be continued. The pupil should be trained to repeat one, two or three notes after the teacher. The scale singing may be varied by the singing of scales in thirds.

A beginning should be made in easy-piano scales with both hands. The pupil may also learn a simple exercise, to be played as a duet with the teacher. Scales on the flageolet and concertina are to be continued. The tubephone may be introduced here. The pupil should also be taught to produce single tones upon the ocharina.

INTERMEDIATE II.

Review. Exercises in scale and tone singing are to be continued, introducing the staff with whole notes. The game-songs should be continued and two easy choral songs added. One of these should be a hymn or anthem; the other may be an easy school song. These are to be taught in addition to the songs learned in combination with the other classes in assembly.

Elementary piano-fingering should be taught, and an easy

piece begun. The use of the concertina, tubeophone, etc. is to be continued.

INTERMEDIATE I.

A thorough review is to be given this class. Motion-songs and dances are to be taught in conjunction with the work in physical culture. Sight singing should be begun and the rudiments of musical notation taught. A part-song is to be taught with the assistance of the Advanced class.

Two simple pieces may be taught upon the piano. The instruments previously used should be continued, the pupil learning to play a simple air upon one or two of them.

ADVANCED.

Review. Thorough drill in choral singing should be given. This choral singing, not only in this class, but in all the classes, should be as far as possible without piano accompaniment. Scale-work and sight-singing are to be continued and each pupil taught (if possible) to sing an easy solo. Training in singing without accompaniment should be given with special attention to sustention of pitch. A part-song is to be sung with the Intermediate I class.

Instruction in reading and writing music should be continued. The value of whole, half and quarter notes, etc. and differences in the expressoin of time should be made clear. The pupil should be required during the year to copy a simple piece of music and explain what each sign means.

As far as possible the pupils are to have individual lessons on the piano. An ocharina quartet should be chosen and trained to play two or three easy pieces.

PLAY

Play is an essential in education, and is spontaneous with the average child. But subnormal children often show no spontaneous tendency to play, and this must therefore be taught to them. Much of the school work is presented in the form of play. This is true of nearly all the kindergarten work and may also be said of much of the physical culture and other training.

For the purpose of developing the "play-instinct" practically every moment of the time out of school, the "play-hours" of the afternoon and evening must be occupied by carefully planned and systematized work. This should be real play to the children. They must be kept quite unconscious of its plan and method, and yet each game or exercise must teach them something of definite value.

During play-time the children are not to be separated into the classes in which they are placed during school. They are to be gathered together in groups which are as it were spontaneously formed, the class divisions of the school-room being purposely avoided. Care must be taken, however, to have these play-groups congenial and so arranged that successful play may be carried on.

The prime factor in all play is *interest*. If interest cannot be aroused in any special form of play it should be at once abandoned. It is only when interest is shown that the play becomes available for education.

There is no phase in the development of the child which may not be trained by play. Practically all play and games are complex. They develop several functions or faculties at one time. They may be classified, however, according to

the particular type of activity which is especially prominent in them. All games are valuable in cultivating a spirit of *fair-play*. Honesty, fairness, consideration for others, a kindly spirit in the rivalry which competition brings, cheerfulness in defeat, in short all that is included in the term "sportsman-like" conduct, may be drawn out and fostered by them.

Various forms of play should be selected by the teacher according to the individual needs of the pupil. A certain number of games are to be played out-of-doors. These must not be permitted to strain the pupil's endurance, or overtax his strength. Indoor games must be selected according to the powers of the child. No play or game should be commenced in which the pupil cannot succeed, at least with help. Several children may be grouped together for a time and then separated and given individual employment. While these changes should be made frequently enough to prevent interest from lagging, no game should be abandoned until some real progress is made in understanding it. The teacher and her assistants should always be ready to participate and to give directions. No form of amusement, even free play, should be performed by the child without guidance. The games selected for each child or group of children should be adapted to their special needs. They should be taught systematically and not allowed to degenerate into mere aimless activity. Particular forms of exercise and sense-training, development of coördination, memory, association and training in esthetic sense should all be included. A special inclination or a special defect may be thus reached by a carefully selected game.

Plays may be classified in a general way according to the type of training for which they are especially well-fitted. A brief outline of some of the forms of play best suited to subnormal children is here presented.

I. PLAY THAT DEVELOPS THE PHYSICAL BODY.

a. *Exercises of the general voluntary muscular system.*

These are in reality a form of physical culture and are performed out-of-doors or in the gymnasium. They include what are commonly called *sports*. Among them may be mentioned: free play, such as simple running or the various forms of tag; foot-racing; jumping; riding; swimming; etc. Systematized games which require definite apparatus: bean-bag; ball; tether-ball; grace-hoop; battledore and shuttle-cock; ring-toss; quoits; fencing; boxing; croquet; bowling-on-the-green; tennis; base-ball; foot-ball (simplified); etc.

b. *Games that develop coördination of the smaller muscle-groups* (especially the hands and arms). This group includes: games requiring muscular control and steadiness, such as jack-straws (plain and magnetic); fish-pond (plain and magnetic); peg-board. Games of manual dexterity coördinated with visual accuracy, such as tiddledy-winks; barber-pole; parlor tennis and football; over the fence. (Block-building and some forms of dissected puzzle-pictures are useful here). Soap-bubble blowing may be included here.

c. *Games that develop special senses.* Here are to be found games that train speed and accuracy of form and

color vision, such as matched pictorial card-games; dissected pictures; dissected blocks; mosaic bricks. Also "observation" games: of objects taken in at one glance, of objects in altered arrangement, changes in the children present in the room, etc. Auditory, olfactory and tactile "guessing" games.

2. PLAY THAT DEVELOPS THE MENTAL FACULTIES.

a. *Arithmetical or counting games.* Many games with playing cards are to be included here, such as casino, euchre, whist, solitaire. Also finch; addition, subtraction, multiplication, division and fraction card games; dominoes; parcheesi; halma, etc.

b. *Spelling games.* In addition to spelling contests, games with dissected words, alphabet games, lotto, etc., are to be included in this group.

c. *Memory and special subject games.* These include some games which are more truly "observation" games. Also such games as: authors, geographic, historical and zoölogical card games, battleship-cards, Bible text-cards, etc.

d. *Puzzles and guessing games.* This group embraces word and picture puzzles, riddles, charades, etc.

e. *Imitative and imaginative games.* Here are grouped all those games and plays which develop particularly the imitative and imaginative faculties. Most important are those which imitate the occupations and activities of adult life. Some of these plays and games appeal more than any others to the mind of the child. They include imitation of

domestic duties, as in playing house, store, doll, tea party, etc.; imitation of travel by automobile, rail or ship, either with improvised conveyances or toy trains, boats, etc.; imitation of animals, as in playing horse, etc.; games with mechanical toys, and many other forms. All these plays are of great value. They not only stimulate the imitative faculty and develop the imagination, but they also correlate in a remarkably efficient manner all the mental and physical activities, and in addition impart much valuable information and inculcate many useful habits.

f. *Constructive games.* Here are to be grouped those games and plays which are essentially constructive. Block-building, while it is of special value in muscular coördination, is also very useful in developing the ability to *make* or *build*. Building houses, stables, cabins, etc., of blocks, logs, stones, sand, snow, etc.; fashioning objects of wood and paper, are in a certain sense occupations belonging to manual training, but they may also be undertaken as real play. Many other forms of constructive work may also be similarly treated.

3. PLAY THAT DEVELOPS THE ESTHETIC SENSE.

In this division are included those occupations which develop an appreciation of forms of beauty and harmonies of color and arrangement. Among them may be mentioned paper cutting, folding and tearing; stick, ring, tablet and block laying. These plays draw out a phase of the imagination which is only partially aroused by games imitative of common life.

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